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HUMAN HEALTH BASELINE RISK ASSESSMENT
Beede Waste Oil/Cash Energy Site
Plaistow, New Hampshire

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APPENDIX G

SAMPLES USED TO CALCULATE EXPOSURE POINT CONCENTRATIONS

APPENDIX G
SAMPLES USED TO CALCULATE EXPOSURE POINT CONCENTRATIONS
Beede Waste Oil/Cash Energy Site
Plaistow, New Hampshire

Soil				Groundwater					Sediment	Surface water	Fish
Ingestion, Dermal, Inhalation (dust and vapor)				Ingestion, Dermal, Inhalation					Ingestion, Dermal	Ingestion, Dermal	Ingestion
Current trespasser and future resident (0 to 1 foot)	Future resident and worker (0 to 10 feet)			Current resident	Future resident			Future worker	Current/future recreational person	Current/future recreational person	Current/future fisherperson
S-40	S-40	TP-136	P9-6	Lot 32-3-04-R	AE-1	SH-14I	SH-7S	AE-3	SS-10	SW-4	KB1BKT01
S-204	S-204	TP-139	P9-7	Lot 51-1-01-CBR-R	AE-4	SH-14S	SH-10S	AE-17S	OS-5	SW-6	KB1BKT02
S-205	S-205	TP-140	P9-8		SH-1I	SH-15I	SH-22R	BR-28	OS-5A	SW-10	KB1BKT03
S-206	S-206	TP-141	P9-9		SH-8	SH-15S(+dup)	SH-53S	SH-6S	OS-5B	SW-11	KB1BKT04
S-208	S-208	TP-142	P9-11		SH-15D	SH-26	WS-1	SH-15S(+dup)	OS-5C	SW-12	KB1BKT05
S-209	S-209	TP-143	P9-12		SH-16I	SH-44	AE-2	SH-20S	OS-6	SW-14	KB1BKT06
S-212	S-212	TP-144	P9-10		SH-16S	SH-47	AE-11D	SH-41	OS-6A	SW-16(+dup)	KB1BKT07
S-213(+dup)	S-213(+ dup)	TP-145	P9-13		SH-36	SH-48	AE-12(+dup)	SH-42	OS-7	SW-17	KB1BKT09
S-49	SP-143/S-1	TP-147	P9-14		SH-38	SH-49	AE-14	SH-43	OS-8(+dup)		KB1BKT10
S-214	S-49	S-215	P9-15		SH-40	SH-52	AE-17D	SH-45	OS-9		KB1BKT11
S-85	S-214	S-217	SP-202		SH-42	WP-4	AE-18S	SH-48	OS-10		KB2BKT01
S-86	SP-125	S-88	S-226		SH-43	WP-5	RFW-1	SH-49			KB2BKT02
S-219	S-85	S-125	S-220		SH-45	WP-6	RFW-2	SH-50			KB2BKT03
S-218	S-86	P1-1	S-210		AE-21	WP-10	SH-2I	SH-52			KB2BKT04
S-87	S-219	P1-2	S-211		AE-22	WP-12	SH-10I				KB2BKT05
S-221	S-218	P2-1	S-36		SH-1D	WP-14	SH-17I				KB3BKT01
S-222	SP-15	P2-2	S-41		SH-3D	WP-15	SH-32				KB3BKT02
S-223	S-87	P6-1	S-69(+dup)		SH-3I	WP-17A	SH-33				KB3BKT03
S-216(+dup)	S-221	P6-2	S-73		SH-3S	SH-2D	SH-34				KB3BKT04
S-224	S-222	P7-1	S-77		SH-4D	SH-10D	SH-37				KB4BKT01
S-225	SP-18	P7-2	SP-9		SH-4I	SH-13D	AE-3				KB4BKT02
S-226	SP-109	P3-1	S-224		SH-4S	SH-14D	AE-5				KB4BKT03
S-220	S-216(+dup)	P3-2	S-223		SH-9	SH-16D	SH-32I				
S-210	SP-200	P8-1(+dup)	P10A-1		SH-11	SH-17D	SH-32S				
S-211	S-225	P8-2	P10A-2		SH-12	SH-18D	SH-33S				
S-36	SP-134(+dup)	P8-3	P10-1		SH-20D	SH-19D	SH-53S				
S-41	P4-1(+dup)	P8-4	P10-2		SH-20I	SH-19I	SH-54S				
S-69(+dup)	P4-2	P8-5(+dup)	P10-3		SH-20S	SH-19S(+dup)	SH-55S				
S-73	P5A-1	P8-6	P10-4		SH-50	WP-3	SH-56S(+dup)				
S-77	P5A-2	P8-7	P10-5		SH-51	AE-8	SH-57S				
TP-139	P5B-1(+dup)	P8-9	P11-1		AE-17S	AE-9(+dup)	SH-24S				
TP-141	P5B-2	P9-1	P11-2		AE-18D	AE-11S					
TP-144	P5A-3	P9-2	P12-1		HM	AE-16					
S-215	P5A-4	P9-3	P12-2		HR	BR-25					
S-217	P5A-5	P9-4	P12-3		SH-2S	BR-28					
S-88	TP-127/139	P9-5	P13-1		SH-41	SH-5S					
S-125					SH-46	SH-6S					

(+dup) indicates that a field duplicate was collected and duplicate sample results were averaged.

APPENDIX H

RAGS PART D TABLE 3 SERIES:

MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY

TABLE 3.1
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current/Future
Medium: Sediment
Medium Description: Kelley Brook
Exposure Medium: Sediment
Exposure Point: Kelley Brook and adjacent wetlands

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Arsenic	ug/kg	2.2E+04	5.8E+04	1.2E+05		ug/kg	5.8E+04	95% UCL-T	W - Test (1)	5.8E+04	95% UCL-T	W - Test (1)
Beryllium	ug/kg	1.2E+03	1.5E+03	2.5E+03		ug/kg	1.5E+03	95% UCL-T	W - Test (1)	1.5E+03	95% UCL-T	W - Test (1)
Chromium	ug/kg	2.5E+04	2.9E+04	3.5E+04		ug/kg	2.9E+04	95% UCL-T	W - Test (1)	2.9E+04	95% UCL-T	W - Test (1)
Manganese	ug/kg	1.5E+06	(2)	1.2E+07	J	ug/kg	1.2E+07	Max	(2)	1.5E+06	Mean	(2)
Mercury	ug/kg	2.4E+02	4.2E+02	1.1E+03		ug/kg	4.2E+02	95% UCL-T	W - Test (1)	4.2E+02	95% UCL-T	W - Test (1)
Thallium	ug/kg	3.1E+02	(3)	6.9E+02		ug/kg	6.9E+02	Max	(3)	2.5E+02	Mean	(3)
Methyl t-butyl ether (MTBE)	ug/kg	4.0E+01	(3)	7.5E+01	J	ug/kg	7.5E+01	Max	(3)	1.7E+01	Mean	(3)
Benz(a)anthracene	ug/kg	5.0E+01	(3)	1.1E+02		ug/kg	1.1E+02	Max	(3)	5.0E+01	Mean	(3)
Chrysene	ug/kg	7.3E+01	3.1E+02	1.5E+02		ug/kg	1.5E+02	Max	(4)	7.3E+01	Mean	(4)
Benzo(b)fluoranthene	ug/kg	5.8E+01	(3)	1.6E+02		ug/kg	1.6E+02	Max	(3)	5.8E+01	Mean	(3)
Benzo(k)fluroanthene	ug/kg	5.1E+01	(3)	1.5E+02		ug/kg	1.5E+02	Max	(3)	5.1E+01	Mean	(3)
Benzo(a)pyrene	ug/kg	5.3E+01	(3)	1.3E+02		ug/kg	1.3E+02	Max	(3)	5.3E+01	Mean	(3)
Indeno(1,2,3-cd)pyrene	ug/kg	3.6E+01	(3)	8.6E+01		ug/kg	8.6E+01	Max	(3)	3.6E+01	Mean	(3)
Dibenz(a,h,)anthracene	ug/kg	1.8E+01	(3)	3.5E+01		ug/kg	3.0E+01	Max	(3)	1.8E+01	Mean	(3)
C11-C22 Aromatics	ug/kg	2.3E+05	1.1E+06	2.0E+06	J	ug/kg	1.1E+06	95% UCL-T	W - Test (1)	1.1E+06	95% UCL-T	W - Test (1)
PCB-77	ug/kg	1.9E+00	(3)	6.2E+00	J	ug/kg	6.2E+00	Max	(3)	1.4E+00	Mean	(3)
PCB-105	ug/kg	3.7E+00	(3)	1.0E+01	J	ug/kg	1.0E+01	Max	(3)	3.7E+00	Mean	(3)
PCB-114	ug/kg	5.6E-01	(3)	9.0E-01	J	ug/kg	9.0E-01	Max	(3)	3.1E-01	Mean	(3)
PCB-118	ug/kg	6.4E+00	(3)	1.6E+01	J	ug/kg	1.6E+01	Max	(3)	6.4E+00	Mean	(3)
PCB-123	ug/kg	1.6E+00	(3)	5.4E+00	J	ug/kg	5.4E+00	Max	(3)	1.6E+00	Mean	(3)
PCB-126	ug/kg	1.4E-01	(3)	1.6E-01	J	ug/kg	1.6E-01	Max	(3)	8.4E-02	Mean	(3)
PCB-128/167	ug/kg	2.4E+00	(3)	9.0E+00	J	ug/kg	9.0E+00	Max	(3)	2.4E+00	Mean	(3)
PCB-156	ug/kg	1.4E+00	(3)	5.2E+00	J	ug/kg	5.2E+00	Max	(3)	1.2E+00	Mean	(3)
PCB-157	ug/kg	3.5E-01	(3)	4.6E-01	J	ug/kg	4.6E-01	Max	(3)	2.0E-01	Mean	(3)
PCB-189	ug/kg	3.1E-01	(3)	6.9E-01	J	ug/kg	6.9E-01	Max	(3)	2.4E-01	Mean	(3)
PCBs (Total)	ug/kg	7.7E+02	(3)	3.5E+03	J	ug/kg	3.5E+03	Max	(3)	7.7E+02	Mean	(3)
PCBs (minus dioxin-like congeners)	ug/kg	7.8E+02	(3)	3.6E+03	J	ug/kg	3.6E+03	Max	(3)	7.8E+02	Mean	(3)

Notes:

For compounds that were not detected, 1/2 detection limit was used as a proxy concentration to calculate the CT EPC and the 95% UCL. Duplicate sample results were averaged.
Only detected concentrations were used to calculate the arithmetic mean.
The maximum dioxin TEQ calculated from the EPCs in this table may differ from the maximum dioxin TEQ in Table 2 because dioxin, furan and dioxin-like PCB congeners that were never detected are not included in this table.
Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Ln-transformed Data (95% UCL-T); Mean of Ln-transformed Data (Mean-T); Mean of Normal Data (Mean-N).
(1) Shapiro-Wilk W Test indicates that data are log-normally distributed ($\alpha = 0.01$). Only detected concentrations were included in the distribution test.
(2) Data are not log-normally or normally distributed. We use the maximum detected concentration for the RME and the arithmetic average concentration for the CT.
(3) There are less than ten detected concentrations; therefore, we did not test the distribution shape of the data. We use the maximum detected concentration for the RME and the average concentration for the CT.
(4) The 95% UCL is greater than the maximum detected concentration, therefore, we use the maximum detected concentration for the RME and the arithmetic average concentration for the CT.

References:

USEPA. 1994. Risk Updates, no. 2. United States Environmental Protection Agency, Region One, Waste Management Division. August 1994.
USEPA. 1992. Supplemental Guidance to RAGS: Calculating the Concentration Term. United States Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C. Intermittent Bulletin, vol. 1, no. 1. May 1992.

TABLE 3.2
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current/Future
Medium: Surface Water
Medium Description: Kelley Brook
Exposure Medium: Surface Water
Exposure Point: Kelley Brook and adjacent wetlands

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Arsenic	ug/L	3.0E+00	(1)	3.8E+00		ug/L	3.8E+00	Max	(1)	1.8E+00	Mean	(1)
Manganese	ug/L	7.2E+02	(1)	1.2E+03		ug/L	1.2E+03	Max	(1)	7.2E+02	Mean	(1)
Molybdenum	ug/L	4.9E+01	(1)	4.9E+01	J	ug/L	4.9E+01	Max	(1)	2.1E+01	Mean	(1)
Vinyl chloride	ug/L	3.0E+00	(1)	3.0E+00		ug/L	3.0E+00	Max	(1)	1.3E+00	Mean	(1)
cis-1,2-Dichloroethene	ug/L	8.0E+00	(1)	1.1E+01		ug/L	1.1E+01	Max	(1)	2.8E+00	Mean	(1)
Benz(a)anthracene	ug/L	9.3E-02	(1)	3.9E-01		ug/L	3.9E-01	Max	(1)	6.0E-02	Mean	(1)
Chrysene	ug/L	1.0E-01	(1)	4.2E-01		ug/L	4.2E-01	Max	(1)	6.5E-02	Mean	(1)
Benzo(b)fluoranthene	ug/L	9.7E-02	(1)	4.1E-01		ug/L	4.1E-01	Max	(1)	6.3E-02	Mean	(1)
Benzo(k)fluoranthene	ug/L	8.5E-02	(1)	3.5E-01		ug/L	3.5E-01	Max	(1)	5.5E-02	Mean	(1)
Benzo(a)pyrene	ug/L	1.0E-01	(1)	4.4E-01		ug/L	4.4E-01	Max	(1)	6.7E-02	Mean	(1)
Indeno(1,2,3-cd)pyrene	ug/L	8.6E-02	(1)	4.2E-01		ug/L	4.2E-01	Max	(1)	6.5E-02	Mean	(1)
Dibenz(a,h,)anthracene	ug/L	6.1E-02	(1)	6.1E-02		ug/L	6.1E-02	Max	(1)	1.2E-02	Mean	(1)
Heptachlor epoxide	ug/L	1.4E-03	(1)	1.7E-03		ug/L	1.7E-03	Max	(1)	9.6E-04	Mean	(1)

For compounds that were not detected, 1/2 detection limit was used as a proxy concentration to calculate the CT EPC and the 95% UCL. Duplicate sample results were averaged.
Only detected concentrations were used to calculate the arithmetic mean.
The maximum dioxin TEQ calculated from the EPCs in this table may differ from the maximum dioxin TEQ in Table 2 because dioxin, furan and dioxin-like PCB congeners that were never detected are not included in this table.
Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Ln-transformed Data (95% UCL-T); Mean of Ln-transformed Data (Mean-T); Mean of Normal Data (Mean-N).
(1) There are less than ten detected concentrations; therefore, we did not test the distribution shape of the data. We use the maximum detected concentration for the RME and the arithmetic average concentration for the CT.

References:

USEPA. 1994. Risk Updates, no. 2. United States Environmental Protection Agency, Region One, Waste Management Division. August 1994.
USEPA. 1992. Supplemental Guidance to RAGS: Calculating the Concentration Term. United States Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C. Intermittent Bulletin, vol. 1, no. 1. May 1992.

TABLE 3.3
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current/Future
Medium: Other (Fish Tissue)
Medium Description: Kelley Brook
Exposure Medium: Animal Tissue
Exposure Point: Brook Trout

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
2,3,7,8-TCDF	mg/kg	4.4E-07	(3)	5.8E-07		mg/kg	5.8E-07	Max	(3)	4.4E-07	Mean	(3)
Aldrin	mg/kg	6.2E-05	(3)	6.2E-05		mg/kg	6.2E-05	Max	(3)	3.1E-05	Mean	(3)
p,p'-DDE	mg/kg	4.6E-03	5.9E-03	7.9E-03		mg/kg	5.9E-03	95% UCL-N	W - Test (2)	5.9E-03	95% UCL-N	W - Test (2)
p,p'-DDT	mg/kg	1.3E-03	(4)	1.1E-02		mg/kg	1.1E-02	Max	(4)	1.4E-03	Mean	(4)
trans-nonachlor	mg/kg	1.0E-03	1.2E-03	2.3E-03		mg/kg	1.2E-03	95% UCL-T	W - Test (1)	1.2E-03	95% UCL-T	W - Test (1)
cis-nonachlor	mg/kg	3.3E-04	(4)	1.3E-03		mg/kg	1.3E-03	Max	(4)	3.3E-04	Mean	(4)
dieldrin	mg/kg	4.8E-04	5.9E-04	8.3E-04		mg/kg	5.9E-04	95% UCL-T	W - Test (1)	5.9E-04	95% UCL-T	W - Test (1)
heptachlor epoxide	mg/kg	1.3E-04	1.6E-04	2.8E-04		mg/kg	1.6E-04	95% UCL-T	W - Test (1)	1.6E-04	95% UCL-T	W - Test (1)
PCB# 105	mg/kg	5.0E-04	6.3E-04	1.0E-03		mg/kg	6.3E-04	95% UCL-N	W - Test (2)	6.3E-04	95% UCL-N	W - Test (2)
PCB# 118/108/149	mg/kg	1.7E-03	2.0E-03	3.1E-03		mg/kg	2.0E-03	95% UCL-T	W - Test (1)	2.0E-03	95% UCL-T	W - Test (1)
PCB# 126	mg/kg	8.3E-06	1.1E-05	1.4E-05		mg/kg	1.1E-05	95% UCL-N	W - Test (2)	1.1E-05	95% UCL-N	W - Test (2)
PCB# 156/171/202	mg/kg	6.8E-04	(4)	7.1E-03		mg/kg	7.1E-03	Max	(4)	6.5E-04	Mean	(4)
PCB# 167	mg/kg	3.4E-04	4.2E-04	1.1E-03		mg/kg	4.2E-04	95% UCL-T	W - Test (1)	4.2E-04	95% UCL-T	W - Test (1)
PCB# 169	mg/kg	6.4E-07	7.9E-07	1.1E-06		mg/kg	7.9E-07	95% UCL-T	W - Test (1)	7.9E-07	95% UCL-T	W - Test (1)
PCB# 189	mg/kg	2.8E-04	(3)	2.8E-04		mg/kg	2.8E-04	Max	(3)	6.9E-05	Mean	(3)
PCB# 77	mg/kg	1.1E-04	1.6E-04	2.8E-04		mg/kg	1.6E-04	95% UCL-N	W- Test (2)	1.6E-04	95% UCL-N	W- Test (2)
PCBs (total)	mg/kg	5.1E-02	(4)	2.8E-01		mg/kg	2.8E-01	Max	(4)	5.1E-02	Mean	(4)
PCBS (minus dioxin-like congeners)	mg/kg	4.8E-02	(4)	2.7E-01		mg/kg	2.7E-01	Max	(4)	4.8E-02	Mean	(4)
Arsenic	mg/kg	2.4E-01	(3)	3.6E-01		mg/kg	3.6E-01	Max	(3)	8.8E-02	Mean	(3)
Chromium	mg/kg	2.7E-01	3.3E-01	9.4E-01		mg/kg	3.3E-01	95% UCL-T	W - Test (1)	3.3E-01	95% UCL-T	W - Test (1)
Copper	mg/kg	6.9E+00	(4)	1.3E+02		mg/kg	1.3E+02	Max	(4)	6.9E+00	Mean	(4)
Mercury	mg/kg	1.60E-01	1.8E-01	2.3E-01		mg/kg	1.8E-01	95% UCL-T	W - Test (2)	1.8E-01	95% UCL-T	W - Test (2)
Manganese	mg/kg	6.1E+00	8.0E+00	1.4E+01		mg/kg	8.0E+00	95% UCL-T	W - Test (1)	8.0E+00	95% UCL-T	W - Test (1)
Lead	mg/kg	1.6E+00	(3)	6.2E+00		mg/kg	6.2E+00	Max	(3)	4.0E-01	Mean	(3)
Zinc	mg/kg	1.9E+01	(4)	9.8E+01		mg/kg	9.8E+01	Max	(4)	1.9E+01	Mean	(4)

For compounds that were not detected, 1/2 detection limit was used as a proxy concentration to calculate the CT EPC and the 95% UCL. Duplicate sample results were averaged.
Only detected concentrations were used to calculate the arithmetic mean.
The maximum dioxin TEQ calculated from the EPCs in this table may differ from the maximum dioxin TEQ in Table 2 because dioxin, furan and dioxin-like PCB congeners that were never detected are not included in this table.
Maximum Qualifiers are not available because the data have not been validated.
Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Ln-transformed Data (95% UCL-T); Mean of Ln-transformed Data (Mean-T); Mean of Normal Data (Mean-N).
(1) Shapiro-Wilk W Test indicates that data are log-normally distributed ($\alpha = 0.01$). Only detected concentrations were included in the distribution test.
(2) Shapiro-Wilk W Test indicates that data are normally distributed ($\alpha = 0.01$). Only detected concentrations were included in the distribution test.
(3) There are less than ten detected concentrations; therefore, we did not test the distribution shape of the data. We use the maximum detected concentration for the RME and the arithmetic average concentration for the CT.
(4) Data are not log-normally or normally distributed. We use the maximum detected concentration for the RME and the arithmetic average concentration for the CT.

References:

USEPA. 1994. Risk Updates, no. 2. United States Environmental Protection Agency, Region One, Waste Management Division. August 1994.
USEPA. 1992. Supplemental Guidance to RAGS: Calculating the Concentration Term. United States Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C. Intermittent Bulletin, vol. 1, no. 1. May 1992.

TABLE 3.4
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current
Medium: Groundwater
Medium Description: Aquifer
Exposure Medium: Groundwater
Exposure Point: Tap Water

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Vinyl chloride	ug/L	2.1E+00	(1)	2.1E+00		ug/L	2.1E+00	Max	(1)	1.2E+00	Mean	(1)
cis-1,2-Dichloroethene	ug/L	2.0E+01	(1)	2.9E+01		ug/L	2.9E+01	Max	(1)	2.0E+01	Mean	(1)
1,2-Dichloroethane	ug/L	1.1E+00	(1)	1.1E+00		ug/L	1.1E+00	Max	(1)	6.5E-01	Mean	(1)
Benzene	ug/L	5.2E-01	(1)	5.2E-01		ug/L	5.2E-01	Max	(1)	3.9E-01	Mean	(1)
Trichloroethene	ug/L	2.6E+00	(1)	4.1E+00		ug/L	4.1E+00	Max	(1)	2.6E+00	Mean	(1)
Heptachlor	ug/L	1.5E-03	(1)	1.7E-03	J	ug/L	1.7E-03	Max	(1)	1.5E-03	Mean	(1)

For compounds that were not detected, 1/2 detection limit was used as a proxy concentration to calculate the CT EPC and the 95% UCL. Duplicate sample results were averaged.
Only detected concentrations were used to calculate the arithmetic mean.
The maximum dioxin TEQ calculated from the EPCs in this table may differ from the maximum dioxin TEQ in Table 2 because dioxin, furan and dioxin-like PCB congeners that were never detected are not included in this table.
Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Ln-transformed Data (95% UCL-T); Mean of Ln-transformed Data (Mean-T); Mean of Normal Data (Mean-N).
(1) There are less than ten detected concentrations; therefore, we did not test the distribution shape of the data. We use the maximum detected concentration for the RME and the arithmetic average concentration for the CT.

References:

USEPA. 1994. Risk Updates, no. 2. United States Environmental Protection Agency, Region One, Waste Management Division. August 1994.
USEPA. 1992. Supplemental Guidance to RAGS: Calculating the Concentration Term. United States Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C. Intermittent Bulletin, vol. 1, no. 1. May 1992.

TABLE 3.5
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current
Medium: Soil
Medium Description: Parcel 1 and Parcel 2 soil, 0 to 1 foot
Exposure Medium: Surface Soil
Exposure Point: 0 to 1 foot soil

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Antimony	ug/kg	6.5E+02	6.2E+02	6.2E+03	J	ug/kg	6.2E+02	95% UCL-T	W - Test (2)	6.2E+02	95% UCL-T	W - Test (2)
Arsenic	ug/kg	6.3E+03	7.0E+03	2.2E+04	J	ug/kg	7.0E+03	95% UCL-T	W - Test (2)	7.0E+03	95% UCL-T	W - Test (2)
Barium	ug/kg	1.4E+05	(3)	3.2E+06		ug/kg	3.2E+06	Max	(3)	1.4E+05	Mean	(3)
Beryllium	ug/kg	3.4E+02	3.6E+02	4.9E+02	J	ug/kg	3.6E+02	95% UCL-T	W - Test (2)	3.6E+02	95% UCL-T	W - Test (2)
Cadmium	ug/kg	1.2E+03	(3)	2.3E+04		ug/kg	2.3E+04	Max	(3)	1.1E+03	Mean	(3)
Chromium	ug/kg	3.1E+04	(3)	5.3E+05		ug/kg	5.3E+05	Max	(3)	3.1E+04	Mean	(3)
Copper	ug/kg	1.2E+04	2.1E+04	4.1E+04		ug/kg	2.1E+04	95% UCL-T	W - Test (2)	2.1E+04	95% UCL-T	W - Test (2)
Lead	ug/kg	7.9E+05	9.0E+05	2.0E+07	J	ug/kg	9.0E+05	95% UCL-T	W - Test (2)	9.0E+05	95% UCL-T	W - Test (2)
Manganese	ug/kg	1.1E+05	(3)	2.6E+05	J	ug/kg	2.6E+05	Max	(3)	1.1E+05	Mean	(3)
Mercury	ug/kg	2.1E+02	3.0E+02	2.0E+03		ug/kg	3.0E+02	95% UCL-T	W - Test (2)	3.0E+02	95% UCL-T	W - Test (2)
Nickel	ug/kg	3.8E+04	(3)	9.2E+05		ug/kg	9.2E+05	Max	(3)	3.8E+04	Mean	(3)
Vanadium	ug/kg	1.4E+04	1.6E+04	1.8E+04		ug/kg	1.6E+04	95% UCL-T	W - Test (2)	1.6E+04	95% UCL-T	W - Test (2)
Zinc	ug/kg	1.0E+05	(3)	1.6E+06		ug/kg	1.6E+06	Max	(3)	1.0E+05	Mean	(3)
Molybdenum	ug/kg	3.4E+03	3.6E+03	2.1E+04		ug/kg	3.6E+03	95% UCL-T	W - Test (2)	3.6E+03	95% UCL-T	W - Test (2)
cis-1,2-Dichloroethene	ug/kg	2.5E+00	(1)	4.0E+00	J	ug/kg	4.0E+00	Max	(1)	4.0E+00	Max	(5)
Tetrachloroethene	ug/kg	7.2E+02	(1)	2.3E+03		ug/kg	2.3E+03	Max	(1)	1.6E+02	Mean	(1)
1,3,5-Trimethylbenzene	ug/kg	2.7E+03	(1)	5.3E+03		ug/kg	5.3E+03	Max	(1)	2.4E+02	Mean	(1)
1,2,4-Trimethylbenzene	ug/kg	4.8E+03	(1)	4.8E+03		ug/kg	4.8E+03	Max	(1)	2.2E+02	Mean	(1)
p-Isopropyltoluene	ug/kg	8.4E+00	(1)	8.4E+00	J	ug/kg	8.4E+00	Max	(1)	8.4E+00	Max	(5)
Naphthalene	ug/kg	2.5E+02	(1)	5.9E+02		ug/kg	5.9E+02	Max	(1)	7.1E+01	Mean	(1)
Benz(a)anthracene	ug/kg	7.9E+02	3.7E+03	4.2E+03	J	ug/kg	3.7E+03	95% UCL-T	W - Test (2)	3.7E+03	95% UCL-T	W - Test (2)
Chrysene	ug/kg	8.6E+02	2.1E+03	7.2E+03	J	ug/kg	2.1E+03	95% UCL-T	W - Test (2)	2.1E+03	95% UCL-T	W - Test (2)
Benzo(b)fluoranthene	ug/kg	3.8E+02	1.2E+03	1.6E+03	J	ug/kg	1.2E+03	95% UCL-T	W - Test (2)	1.2E+03	95% UCL-T	W - Test (2)
Benzo(k)fluoranthene	ug/kg	3.4E+02	(3)	1.7E+03	J	ug/kg	1.7E+03	Max	(3)	4.3E+02	Mean	(3)
Benzo(a)pyrene	ug/kg	3.9E+02	(3)	2.0E+03	J	ug/kg	2.0E+03	Max	(3)	4.7E+02	Mean	(3)
Indeno(1,2,3-cd)pyrene	ug/kg	2.0E+02	6.6E+02	1.2E+03	J	ug/kg	6.6E+02	95% UCL-T	W - Test (2)	6.6E+02	95% UCL-T	W - Test (2)
Dibenz(a,h,)anthracene	ug/kg	9.0E+01	(1)	2.8E+02	J	ug/kg	2.8E+02	Max	(1)	2.8E+02	Max	(5)
bis(2-Ethylhexyl)phthalate	ug/kg	2.8E+04	3.6E+05	1.3E+05	EB	ug/kg	1.3E+05	Max	(4)	2.3E+04	Mean	(4)
C9-C18 Aliphatics	ug/kg	6.6E+05	9.7E+06	4.6E+06		ug/kg	4.6E+06	Max	(4)	4.8E+05	Mean	(4)
C11-C22 Aromatics	ug/kg	1.0E+06	8.3E+06	8.2E+06		ug/kg	8.2E+06	Max	(4)	8.8E+05	Mean	(4)
PCBs (total)	ug/kg	5.4E+04	3.8E+05	6.8E+05	DJ	ug/kg	3.8E+05	95% UCL-T	W - Test (2)	3.8E+05	95% UCL-T	W - Test (2)
PCBs (minus dioxin-like congeners)	ug/kg	5.3E+04	3.7E+05	6.7E+05	DJ	ug/kg	3.7E+05	95% UCL-T	W - Test (2)	3.7E+05	95% UCL-T	W - Test (2)
PCB-77	ug/kg	7.3E+02	(1)	3.0E+03	D	ug/kg	3.0E+03	Max	(1)	7.3E+02	Mean	(1)
PCB-81	ug/kg	3.3E+01	(1)	9.8E+01		ug/kg	9.8E+01	Max	(1)	3.3E+01	Mean	(1)
PCB-118	ug/kg	1.7E+03	(1)	7.2E+03	DJ	ug/kg	7.2E+03	Max	(1)	1.7E+03	Mean	(1)
PCB-123	ug/kg	1.8E+02	(1)	7.4E+02	D	ug/kg	7.4E+02	Max	(1)	1.8E+02	Mean	(1)
PCB-105	ug/kg	1.0E+03	(1)	4.4E+03	D	ug/kg	4.4E+03	Max	(1)	1.0E+03	Mean	(1)
PCB-114	ug/kg	1.0E+02	(1)	4.4E+02	D	ug/kg	4.4E+02	Max	(1)	1.0E+02	Mean	(1)
PCB-126	ug/kg	8.0E+00	(1)	2.8E+01		ug/kg	2.8E+01	Max	(1)	8.0E+00	Mean	(1)
PCB-128/167	ug/kg	1.1E+02	(1)	4.2E+02	D	ug/kg	4.2E+02	Max	(1)	1.1E+02	Mean	(1)
PCB-156	ug/kg	5.8E+01	(1)	2.2E+02	D	ug/kg	2.2E+02	Max	(1)	5.8E+01	Mean	(1)
PCB-157	ug/kg	1.3E+01	(1)	5.4E+01		ug/kg	5.4E+01	Max	(1)	1.3E+01	Mean	(1)
PCB-189	ug/kg	2.2E+00	(1)	8.3E+00		ug/kg	8.3E+00	Max	(1)	8.3E+00	Max	(5)

TABLE 3.5
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current
Medium: Soil
Medium Description: Parcel 1 and Parcel 2 soil, 0 to 1 foot
Exposure Medium: Surface Soil
Exposure Point: 0 to 1 foot soil

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
2,3,7,8-TCDD	ug/kg	3.0E-04	(1)	3.9E-04		ug/kg	3.9E-04	Max	(1)	3.0E-04	Mean	(1)
1,2,3,7,8-PeCDD	ug/kg	1.8E-03	(1)	3.6E-03		ug/kg	3.6E-03	Max	(1)	1.8E-03	Mean	(1)
1,2,3,4,7,8-HxCDD	ug/kg	2.9E-03	(1)	5.1E-03		ug/kg	5.1E-03	Max	(1)	2.9E-03	Mean	(1)
1,2,3,6,7,8-HxCDD	ug/kg	7.7E-03	(1)	1.2E-02		ug/kg	1.2E-02	Max	(1)	7.7E-03	Mean	(1)
1,2,3,7,8,9-HxCDD	ug/kg	5.7E-03	(1)	1.0E-02		ug/kg	1.0E-02	Max	(1)	5.7E-03	Mean	(1)
1,2,3,4,6,7,8-HpCDD	ug/kg	1.3E-01	(1)	2.5E-01		ug/kg	2.5E-01	Max	(1)	1.3E-01	Mean	(1)
OCDD	ug/kg	1.0E+00	(1)	2.0E+00		ug/kg	2.0E+00	Max	(1)	1.0E+00	Mean	(1)
2,3,7,8-TDCF	ug/kg	2.0E-02	(1)	5.9E-02		ug/kg	5.9E-02	Max	(1)	2.0E-02	Mean	(1)
1,2,3,7,8,-PeCDF	ug/kg	7.7E-03	(1)	2.2E-02		ug/kg	2.2E-02	Max	(1)	7.7E-03	Mean	(1)
2,3,4,7,8,-PeCDF	ug/kg	5.5E-02	(1)	1.4E-01		ug/kg	1.4E-01	Max	(1)	5.5E-02	Mean	(1)
1,2,3,4,7,8-HxCDF	ug/kg	1.5E-02	(1)	3.2E-02		ug/kg	3.2E-02	Max	(1)	1.5E-02	Mean	(1)
1,2,3,6,7,8-HxCDF	ug/kg	8.8E-03	(1)	1.9E-02	J+	ug/kg	1.9E-02	Max	(1)	8.8E-03	Mean	(1)
2,3,4,6,7,8-HxCDF	ug/kg	1.0E-02	(1)	2.1E-02		ug/kg	2.1E-02	Max	(1)	1.0E-02	Mean	(1)
1,2,3,7,8,9-HxCDF	ug/kg	4.3E-03	(1)	1.1E-02		ug/kg	1.1E-02	Max	(1)	4.3E-03	Mean	(1)
1,2,3,4,6,7,8-HpCDF	ug/kg	3.4E-02	(1)	6.3E-02		ug/kg	6.3E-02	Max	(1)	3.4E-02	Mean	(1)
1,2,3,4,7,8,9-HpCDF	ug/kg	3.8E-03	(1)	7.8E-03		ug/kg	7.8E-03	Max	(1)	3.8E-03	Mean	(1)
OCDF	ug/kg	5.2E-02	(1)	1.0E-01		ug/kg	1.0E-01	Max	(1)	5.2E-02	Mean	(1)

For compounds that were not detected, 1/2 detection limit was used as a proxy concentration to calculate the CT EPC and the 95% UCL. Duplicate sample results were averaged.
Only detected concentrations were used to calculate the arithmetic mean.
The maximum dioxin TEQ calculated from the EPCs in this table may differ from the maximum dioxin TEQ in Table 2 because dioxin, furan and dioxin-like PCB congeners that were never detected are not included in this table.
Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Ln-transformed Data (95% UCL-T); Mean of Ln-transformed Data (Mean-T); Mean of Normal Data (Mean-N).
(1) There are less than ten detected concentrations; therefore, we did not test the distribution shape of the data. We use the maximum detected concentration for the RME and the arithmetic average concentration for the CT.
(2) Shapiro-Wilk W Test indicates that data are log-normally distributed ($\alpha = 0.01$). Only detected concentrations were included in the distribution test.
(3) Data are not log-normally or normally distributed. We use the maximum detected concentration for the RME and the arithmetic average concentration for the CT.
(4) The 95% UCL is greater than the maximum detected concentration, therefore, we use the maximum detected concentration for the RME and the arithmetic average concentration for the CT.
(5) The mean (calculated using half the detection limit for non-detect) is greater than the maximum detected concentration, due to exceptionally high detection limits in a few samples. Therefore, we use the maximum detected concentration for the CT EPC.

References:

USEPA. 1994. Risk Updates, no. 2. United States Environmental Protection Agency, Region One, Waste Management Division. August 1994.
USEPA. 1992. Supplemental Guidance to RAGS: Calculating the Concentration Term. United States Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C. Intermittent Bulletin, vol. 1, no. 1. May 1992.

TABLE 3.6
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current
Medium: Soil
Medium Description: Parcel 1 and Parcel 2 soil, 0 to 1 foot
Exposure Medium: Particulates
Exposure Point: Fugitive dust

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Antimony	ug/kg	6.5E+02	6.2E+02	6.2E+03	J	ug/kg	6.2E+02	95% UCL-T	W - Test (2)	6.2E+02	95% UCL-T	W - Test (2)
Arsenic	ug/kg	6.3E+03	7.0E+03	2.2E+04	J	ug/kg	7.0E+03	95% UCL-T	W - Test (2)	7.0E+03	95% UCL-T	W - Test (2)
Barium	ug/kg	1.4E+05	(3)	3.2E+06		ug/kg	3.2E+06	Max	(3)	1.4E+05	Mean	(3)
Beryllium	ug/kg	3.4E+02	3.6E+02	4.9E+02	J	ug/kg	3.6E+02	95% UCL-T	W - Test (2)	3.6E+02	95% UCL-T	W - Test (2)
Cadmium	ug/kg	1.2E+03	(3)	2.3E+04		ug/kg	2.3E+04	Max	(3)	1.1E+03	Mean	(3)
Chromium	ug/kg	3.1E+04	(3)	5.3E+05		ug/kg	5.3E+05	Max	(3)	3.1E+04	Mean	(3)
Copper	ug/kg	1.2E+04	2.1E+04	4.1E+04		ug/kg	2.1E+04	95% UCL-T	W - Test (2)	2.1E+04	95% UCL-T	W - Test (2)
Lead	ug/kg	7.9E+05	9.0E+05	2.0E+07	J	ug/kg	9.0E+05	95% UCL-T	W - Test (2)	9.0E+05	95% UCL-T	W - Test (2)
Manganese	ug/kg	1.1E+05	(3)	2.6E+05	J	ug/kg	2.6E+05	Max	(3)	1.1E+05	Mean	(3)
Mercury	ug/kg	2.1E+02	3.0E+02	2.0E+03		ug/kg	3.0E+02	95% UCL-T	W - Test (2)	3.0E+02	95% UCL-T	W - Test (2)
Nickel	ug/kg	3.8E+04	(3)	9.2E+05		ug/kg	9.2E+05	Max	(3)	3.8E+04	Mean	(3)
Vanadium	ug/kg	1.4E+04	1.6E+04	1.8E+04		ug/kg	1.6E+04	95% UCL-T	W - Test (2)	1.6E+04	95% UCL-T	W - Test (2)
Zinc	ug/kg	1.0E+05	(3)	1.6E+06		ug/kg	1.6E+06	Max	(3)	1.0E+05	Mean	(3)
Molybdenum	ug/kg	3.4E+03	3.6E+03	2.1E+04		ug/kg	3.6E+03	95% UCL-T	W - Test (2)	3.6E+03	95% UCL-T	W - Test (2)
cis-1,2-Dichloroethene	ug/kg	2.5E+00	(1)	4.0E+00	J	ug/kg	4.0E+00	Max	(1)	4.0E+00	Max	(5)
Tetrachloroethene	ug/kg	7.2E+02	(1)	2.3E+03		ug/kg	2.3E+03	Max	(1)	1.6E+02	Mean	(1)
1,3,5-Trimethylbenzene	ug/kg	2.7E+03	(1)	5.3E+03		ug/kg	5.3E+03	Max	(1)	2.4E+02	Mean	(1)
1,2,4-Trimethylbenzene	ug/kg	4.8E+03	(1)	4.8E+03		ug/kg	4.8E+03	Max	(1)	2.2E+02	Mean	(1)
p-Isopropyltoluene	ug/kg	8.4E+00	(1)	8.4E+00	J	ug/kg	8.4E+00	Max	(1)	8.4E+00	Max	(5)
Naphthalene	ug/kg	2.5E+02	(1)	5.9E+02		ug/kg	5.9E+02	Max	(1)	7.1E+01	Mean	(1)
Benz(a)anthracene	ug/kg	7.9E+02	3.7E+03	4.2E+03	J	ug/kg	3.7E+03	95% UCL-T	W - Test (2)	3.7E+03	95% UCL-T	W - Test (2)
Chrysene	ug/kg	8.6E+02	2.1E+03	7.2E+03	J	ug/kg	2.1E+03	95% UCL-T	W - Test (2)	2.1E+03	95% UCL-T	W - Test (2)
Benzo(b)fluoranthene	ug/kg	3.8E+02	1.2E+03	1.6E+03	J	ug/kg	1.2E+03	95% UCL-T	W - Test (2)	1.2E+03	95% UCL-T	W - Test (2)
Benzo(k)fluoranthene	ug/kg	3.4E+02	(3)	1.7E+03	J	ug/kg	1.7E+03	Max	(3)	4.3E+02	Mean	(3)
Benzo(a)pyrene	ug/kg	3.9E+02	(3)	2.0E+03	J	ug/kg	2.0E+03	Max	(3)	4.7E+02	Mean	(3)
Indeno(1,2,3-cd)pyrene	ug/kg	2.0E+02	6.6E+02	1.2E+03	J	ug/kg	6.6E+02	95% UCL-T	W - Test (2)	6.6E+02	95% UCL-T	W - Test (2)
Dibenz(a,h,)anthracene	ug/kg	9.0E+01	(1)	2.8E+02	J	ug/kg	2.8E+02	Max	(1)	2.8E+02	Max	(5)
bis(2-Ethylhexyl)phthalate	ug/kg	2.8E+04	3.6E+05	1.3E+05	EB	ug/kg	1.3E+05	Max	(4)	2.3E+04	Mean	(4)
C9-C18 Aliphatics	ug/kg	6.6E+05	9.7E+06	4.6E+06		ug/kg	4.6E+06	Max	(4)	4.8E+05	Mean	(4)
C11-C22 Aromatics	ug/kg	1.0E+06	8.3E+06	8.2E+06		ug/kg	8.2E+06	Max	(4)	8.8E+05	Mean	(4)
PCBs (total)	ug/kg	5.4E+04	3.8E+05	6.8E+05	DJ	ug/kg	3.8E+05	95% UCL-T	W - Test (2)	3.8E+05	95% UCL-T	W - Test (2)
PCBs (minus dioxin-like congeners)	ug/kg	5.3E+04	3.7E+05	6.7E+05	DJ	ug/kg	3.7E+05	95% UCL-T	W - Test (2)	3.7E+05	95% UCL-T	W - Test (2)
PCB-77	ug/kg	7.3E+02	(1)	3.0E+03	D	ug/kg	3.0E+03	Max	(1)	7.3E+02	Mean	(1)
PCB-81	ug/kg	3.3E+01	(1)	9.8E+01		ug/kg	9.8E+01	Max	(1)	3.3E+01	Mean	(1)
PCB-118	ug/kg	1.7E+03	(1)	7.2E+03	DJ	ug/kg	7.2E+03	Max	(1)	1.7E+03	Mean	(1)
PCB-123	ug/kg	1.8E+02	(1)	7.4E+02	D	ug/kg	7.4E+02	Max	(1)	1.8E+02	Mean	(1)
PCB-105	ug/kg	1.0E+03	(1)	4.4E+03	D	ug/kg	4.4E+03	Max	(1)	1.0E+03	Mean	(1)
PCB-114	ug/kg	1.0E+02	(1)	4.4E+02	D	ug/kg	4.4E+02	Max	(1)	1.0E+02	Mean	(1)
PCB-126	ug/kg	8.0E+00	(1)	2.8E+01		ug/kg	2.8E+01	Max	(1)	8.0E+00	Mean	(1)
PCB-128/167	ug/kg	1.1E+02	(1)	4.2E+02	D	ug/kg	4.2E+02	Max	(1)	1.1E+02	Mean	(1)
PCB-156	ug/kg	5.8E+01	(1)	2.2E+02	D	ug/kg	2.2E+02	Max	(1)	5.8E+01	Mean	(1)
PCB-157	ug/kg	1.3E+01	(1)	5.4E+01		ug/kg	5.4E+01	Max	(1)	1.3E+01	Mean	(1)
PCB-189	ug/kg	2.2E+00	(1)	8.3E+00		ug/kg	8.3E+00	Max	(1)	8.3E+00	Max	(5)

TABLE 3.6
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current
Medium: Soil
Medium Description: Parcel 1 and Parcel 2 soil, 0 to 1 foot
Exposure Medium: Particulates
Exposure Point: Fugitive dust

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
2,3,7,8-TCDD	ug/kg	3.0E-04	(1)	3.9E-04		ug/kg	3.9E-04	Max	(1)	3.0E-04	Mean	(1)
1,2,3,7,8-PeCDD	ug/kg	1.8E-03	(1)	3.6E-03		ug/kg	3.6E-03	Max	(1)	1.8E-03	Mean	(1)
1,2,3,4,7,8-HxCDD	ug/kg	2.9E-03	(1)	5.1E-03		ug/kg	5.1E-03	Max	(1)	2.9E-03	Mean	(1)
1,2,3,6,7,8-HxCDD	ug/kg	7.7E-03	(1)	1.2E-02		ug/kg	1.2E-02	Max	(1)	7.7E-03	Mean	(1)
1,2,3,7,8,9-HxCDD	ug/kg	5.7E-03	(1)	1.0E-02		ug/kg	1.0E-02	Max	(1)	5.7E-03	Mean	(1)
1,2,3,4,6,7,8-HpCDD	ug/kg	1.3E-01	(1)	2.5E-01		ug/kg	2.5E-01	Max	(1)	1.3E-01	Mean	(1)
OCDD	ug/kg	1.0E+00	(1)	2.0E+00		ug/kg	2.0E+00	Max	(1)	1.0E+00	Mean	(1)
2,3,7,8-TDCF	ug/kg	2.0E-02	(1)	5.9E-02		ug/kg	5.9E-02	Max	(1)	2.0E-02	Mean	(1)
1,2,3,7,8,-PeCDF	ug/kg	7.7E-03	(1)	2.2E-02		ug/kg	2.2E-02	Max	(1)	7.7E-03	Mean	(1)
2,3,4,7,8,-PeCDF	ug/kg	5.5E-02	(1)	1.4E-01		ug/kg	1.4E-01	Max	(1)	5.5E-02	Mean	(1)
1,2,3,4,7,8-HxCDF	ug/kg	1.5E-02	(1)	3.2E-02		ug/kg	3.2E-02	Max	(1)	1.5E-02	Mean	(1)
1,2,3,6,7,8-HxCDF	ug/kg	8.8E-03	(1)	1.9E-02	J+	ug/kg	1.9E-02	Max	(1)	8.8E-03	Mean	(1)
2,3,4,6,7,8-HxCDF	ug/kg	1.0E-02	(1)	2.1E-02		ug/kg	2.1E-02	Max	(1)	1.0E-02	Mean	(1)
1,2,3,7,8,9-HxCDF	ug/kg	4.3E-03	(1)	1.1E-02		ug/kg	1.1E-02	Max	(1)	4.3E-03	Mean	(1)
1,2,3,4,6,7,8-HpCDF	ug/kg	3.4E-02	(1)	6.3E-02		ug/kg	6.3E-02	Max	(1)	3.4E-02	Mean	(1)
1,2,3,4,7,8,9-HpCDF	ug/kg	3.8E-03	(1)	7.8E-03		ug/kg	7.8E-03	Max	(1)	3.8E-03	Mean	(1)
OCDF	ug/kg	5.2E-02	(1)	1.0E-01		ug/kg	1.0E-01	Max	(1)	5.2E-02	Mean	(1)

For compounds that were not detected, 1/2 detection limit was used as a proxy concentration to calculate the CT EPC and the 95% UCL. Duplicate sample results were averaged.
Only detected concentrations were used to calculate the arithmetic mean.
The maximum dioxin TEQ calculated from the EPCs in this table may differ from the maximum dioxin TEQ in Table 2 because dioxin, furan and dioxin-like PCB congeners that were never detected are not included in this table.
Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Ln-transformed Data (95% UCL-T); Mean of Ln-transformed Data (Mean-T); Mean of Normal Data (Mean-N).
(1) There are less than ten detected concentrations; therefore, we did not test the distribution shape of the data. We use the maximum detected concentration for the RME and the arithmetic average concentration for the CT.
(2) Shapiro-Wilk W Test indicates that data are log-normally distributed ($\alpha = 0.01$). Only detected concentrations were included in the distribution test.
(3) Data are not log-normally or normally distributed. We use the maximum detected concentration for the RME and the arithmetic average concentration for the CT.
(4) The 95% UCL is greater than the maximum detected concentration, therefore, we use the maximum detected concentration for the RME and the arithmetic average concentration for the CT.
(5) The mean (calculated using half the detection limit for non-detect) is greater than the maximum detected concentration, due to exceptionally high detection limits in a few samples. Therefore, we use the maximum detected concentration for the CT EPC.

References:

USEPA. 1994. Risk Updates, no. 2. United States Environmental Protection Agency, Region One, Waste Management Division. August 1994.
USEPA. 1992. Supplemental Guidance to RAGS: Calculating the Concentration Term. United States Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C. Intermittent Bulletin, vol. 1, no. 1. May 1992.

TABLE 3.7
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current
Medium: Soil
Medium Description: Parcel 1 and Parcel 2 soil, 0 to 1 foot
Exposure Medium: Vapors
Exposure Point: Vapors from surface soils

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
cis-1,2-Dichloroethene	ug/kg	2.5E+00	(1)	4.0E+00	J	ug/kg	4.0E+00	Max	(1)	4.0E+00	Max	(3)
Tetrachloroethene	ug/kg	7.2E+02	(1)	2.3E+03		ug/kg	2.3E+03	Max	(1)	1.6E+02	Mean	(1)
1,3,5-Trimethylbenzene	ug/kg	2.7E+03	(1)	5.3E+03		ug/kg	5.3E+03	Max	(1)	2.4E+02	Mean	(1)
1,2,4-Trimethylbenzene	ug/kg	4.8E+03	(1)	4.8E+03		ug/kg	4.8E+03	Max	(1)	2.2E+02	Mean	(1)
p-Isopropyltoluene	ug/kg	8.4E+00	(1)	8.4E+00	J	ug/kg	8.4E+00	Max	(1)	8.4E+00	Max	(3)
Naphthalene	ug/kg	2.5E+02	(1)	5.9E+02		ug/kg	5.9E+02	Max	(1)	7.1E+01	Mean	(1)
bis(2-Ethylhexyl)phthalate	ug/kg	2.8E+04	3.6E+05	1.3E+05	EB	ug/kg	1.3E+05	Max	(2)	2.3E+04	Mean	(2)
C9-C18 Aliphatics	ug/kg	6.6E+05	9.7E+06	4.6E+06		ug/kg	4.6E+06	Max	(2)	4.8E+05	Mean	(2)
C11-C22 Aromatics	ug/kg	1.0E+06	8.3E+06	8.2E+06		ug/kg	8.2E+06	Max	(2)	8.8E+05	Mean	(2)

For compounds that were not detected, 1/2 detection limit was used as a proxy concentration to calculate the CT EPC and the 95% UCL. Duplicate sample results were averaged.
Only detected concentrations were used to calculate the arithmetic mean.
The maximum dioxin TEQ calculated from the EPCs in this table may differ from the maximum dioxin TEQ in Table 2 because dioxin, furan and dioxin-like PCB congeners that were never detected are not included in this table.
Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Ln-transformed Data (95% UCL-T); Mean of Ln-transformed Data (Mean-T); Mean of Normal Data (Mean-N).
(1) There are less than ten detected concentrations; therefore, we did not test the distribution shape of the data. We use the maximum detected concentration for the RME and the arithmetic average concentration for the CT.
(2) The 95% UCL is greater than the maximum detected concentration, therefore, we use the maximum detected concentration for the RME and the arithmetic average concentration for the CT.
(3) The mean (calculated using half the detection limit for non-detect) is greater than the maximum detected concentration, due to exceptionally high detection limits in a few samples. Therefore, we use the maximum detected concentration for the CT EPC.

References:

USEPA. 1994. Risk Updates, no. 2. United States Environmental Protection Agency, Region One, Waste Management Division. August 1994.
USEPA. 1992. Supplemental Guidance to RAGS: Calculating the Concentration Term. United States Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C. Intermittent Bulletin, vol. 1, no. 1. May 1992.

TABLE 3.8
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Medium: Groundwater
Medium Description: Aquifer
Exposure Medium: Groundwater
Exposure Point: Excavation Site

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Arsenic	ug/L	2.8E+01	(2)	2.8E+01	J	ug/L	2.8E+01	Max	(2)	1.1E+01	Mean	(2)
Manganese	ug/L	3.7E+03	(2)	4.1E+03		ug/L	4.1E+03	Max	(2)	3.7E+03	Mean	(2)
Nitrate-N	ug/L	2.6E+02	(2)	3.6E+02	J	ug/L	3.6E+02	Max	(2)	1.2E+02	Mean	(2)
Vinyl chloride	ug/L	3.5E+02	(2)	7.3E+02		ug/L	7.3E+02	Max	(2)	7.6E+01	Mean	(2)
Chloroethane	ug/L	5.3E+01	(2)	7.1E+01		ug/L	7.1E+01	Max	(2)	9.0E+00	Mean	(2)
1,1-Dichloroethene	ug/L	8.0E+00	(2)	8.0E+00		ug/L	8.0E+00	Max	(2)	2.2E+00	Mean	(2)
trans-1,2-Dichloroethene	ug/L	4.1E+01	(2)	1.0E+02		ug/L	1.0E+02	Max	(2)	1.5E+01	Mean	(2)
1,1-Dichloroethane	ug/L	7.4E+01	(2)	3.1E+02		ug/L	3.1E+02	Max	(2)	3.8E+01	Mean	(2)
cis-1,2-Dichloroethene	ug/L	8.7E+02	(2)	2.5E+03	D	ug/L	2.5E+03	Max	(2)	3.1E+02	Mean	(2)
1,1,1-Trichloroethane	ug/L	2.5E+02	(2)	6.3E+02		ug/L	6.3E+02	Max	(2)	8.9E+01	Mean	(2)
Benzene	ug/L	9.7E+01	(2)	2.4E+02		ug/L	2.4E+02	Max	(2)	2.9E+01	Mean	(2)
Trichloroethene	ug/L	6.2E+00	(2)	1.3E+01		ug/L	1.3E+01	Max	(2)	3.0E+00	Mean	(2)
Toluene	ug/L	1.6E+02	(2)	4.8E+02		ug/L	4.8E+02	Max	(2)	4.7E+01	Mean	(2)
Tetrachloroethene	ug/L	8.6E+00	(2)	2.5E+01		ug/L	2.5E+01	Max	(2)	3.9E+00	Mean	(2)
Ethylbenzene	ug/L	3.8E+02	(2)	9.4E+02	D	ug/L	9.4E+02	Max	(2)	1.1E+02	Mean	(2)
1,1,2,2-Tetrachloroethane	ug/L	1.9E+00	(2)	1.9E+00	J	ug/L	1.9E+00	Max	(2)	1.9E+00	Mean	(2)
n-Propylbenzene (1)	ug/L	2.6E+01	(2)	4.3E+01		ug/L	4.3E+01	Max	(2)	8.2E+00	Mean	(2)
1,3,5-Trimethylbenzene (1)	ug/L	1.3E+02	(2)	2.0E+02		ug/L	2.0E+02	Max	(2)	3.9E+01	Mean	(2)
1,2,4-Trimethylbenzene (1)	ug/L	2.8E+02	(2)	4.6E+02	D	ug/L	4.6E+02	Max	(2)	8.1E+01	Mean	(2)
sec-Butylbenzene (1)	ug/L	8.9E+00	(2)	1.5E+01		ug/L	1.5E+01	Max	(2)	3.3E+00	Mean	(2)
p-Isopropyltoluene (1)	ug/L	9.6E+00	(2)	1.5E+01		ug/L	1.5E+01	Max	(2)	3.5E+00	Mean	(2)
1,2-Dichlorobenzene	ug/L	1.3E+01	(2)	2.2E+01		ug/L	2.2E+01	Max	(2)	3.7E+00	Mean	(2)
Naphthalene	ug/L	1.2E+02	(2)	1.7E+02		ug/L	1.7E+02	Max	(2)	3.4E+01	Mean	(2)

For compounds that were not detected, 1/2 detection limit was used as a proxy concentration to calculate the CT EPC and the 95% UCL. Duplicate sample results were averaged.
Only detected concentrations were used to calculate the arithmetic mean.
The maximum dioxin TEQ calculated from the EPCs in this table may differ from the maximum dioxin TEQ in Table 2 because dioxin, furan and dioxin-like PCB congeners that were never detected are not included in this table.
Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Ln-transformed Data (95% UCL-T); Mean of Ln-transformed Data (Mean-T); Mean of Normal Data (Mean-N).
(1) These compounds have been included as COPCs because the sum of the maximum concentrations of the following compounds exceed the NHDES ambient groundwater quality standard for alkylbenzenes of 50 ug/L: 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, n-propyl benzene, n-butyl benzene, 4-isopropyltoluene, tert-butyl benzene, and sec-butyl benzene.
(2) There are less than ten detected concentrations; therefore, we did not test the distribution shape of the data. We use the maximum detected concentration for the RME and the arithmetic average concentration for the CT.

References:

USEPA. 1994. Risk Updates, no. 2. United States Environmental Protection Agency, Region One, Waste Management Division. August 1994.
USEPA. 1992. Supplemental Guidance to RAGS: Calculating the Concentration Term. United States Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C. Intermittent Bulletin, vol. 1, no. 1. May 1992.

TABLE 3.9
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Medium: Groundwater
Medium Description: Aquifer
Exposure Medium: Groundwater
Exposure Point: Tap Water

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Antimony	ug/L	7.0E+00	(2)	7.0E+00		ug/L	7.0E+00	Max	(2)	3.1E+00	Mean	(2)
Arsenic	ug/L	1.7E+01	(2)	2.8E+01	J	ug/L	2.8E+01	Max	(2)	1.1E+01	Mean	(2)
Barium	ug/L	4.7E+02	(2)	4.7E+02		ug/L	4.7E+02	Max	(2)	1.0E+02	Mean	(2)
Cadmium	ug/L	4.5E+00	(2)	8.0E+00		ug/L	8.0E+00	Max	(2)	6.1E-01	Mean	(2)
Chromium	ug/L	4.4E+01	(2)	6.4E+01		ug/L	6.4E+01	Max	(2)	1.2E+01	Mean	(2)
Manganese	ug/L	2.2E+03	(2)	6.4E+03		ug/L	6.4E+03	Max	(2)	2.1E+03	Mean	(2)
Nitrate-N	ug/L	6.3E+02	(2)	6.0E+03	J	ug/L	6.0E+03	Max	(2)	2.5E+02	Mean	(2)
Selenium	ug/L	1.6E+01	(2)	2.0E+01	J	ug/L	2.0E+01	Max	(2)	5.3E+00	Mean	(2)
Chloromethane	ug/L	5.0E+00	(2)	5.0E+00		ug/L	5.0E+00	Max	(2)	1.5E+00	Mean	(2)
Vinyl chloride	ug/L	1.2E+02	(2)	7.3E+02		ug/L	7.3E+02	Max	(2)	1.7E+01	Mean	(2)
Chloroethane	ug/L	4.9E+01	(2)	2.3E+02		ug/L	2.3E+02	Max	(2)	6.3E+00	Mean	(2)
1,1-Dichloroethene	ug/L	6.8E+00	(2)	1.2E+01		ug/L	1.2E+01	Max	(2)	1.7E+00	Mean	(2)
Methylene chloride (Dichloromethane)	ug/L	2.4E+02	(2)	1.9E+03	D	ug/L	1.9E+03	Max	(2)	2.6E+01	Mean	(2)
Methyl t-butyl ether	ug/L	2.0E+01	(2)	1.2E+02		ug/L	1.2E+02	Max	(2)	2.9E+00	Mean	(2)
trans-1,2-Dichloroethene	ug/L	3.0E+01	(2)	1.0E+02		ug/L	1.0E+02	Max	(2)	4.0E+00	Mean	(2)
1,1-Dichloroethane	ug/L	8.4E+01	(2)	1.1E+03		ug/L	1.1E+03	Max	(2)	2.8E+01	Mean	(2)
cis-1,2-Dichloroethene	ug/L	3.6E+02	(2)	2.5E+03	D	ug/L	2.5E+03	Max	(2)	1.3E+02	Mean	(2)
1,1,1-Trichloroethane	ug/L	9.8E+01	(2)	6.3E+02		ug/L	6.3E+02	Max	(2)	3.5E+01	Mean	(2)
1,2-Dichloroethane	ug/L	1.1E+01	(2)	1.8E+01	J	ug/L	1.8E+01	Max	(2)	2.0E+00	Mean	(2)
Benzene	ug/L	4.8E+01	(2)	2.4E+02		ug/L	2.4E+02	Max	(2)	1.1E+01	Mean	(2)
Trichloroethene	ug/L	7.5E+01	(2)	8.8E+02		ug/L	8.8E+02	Max	(2)	2.2E+01	Mean	(2)
Toluene	ug/L	2.1E+02	(2)	5.5E+02		ug/L	5.5E+02	Max	(2)	3.4E+01	Mean	(2)
Tetrachloroethene	ug/L	8.4E+00	(2)	2.5E+01		ug/L	2.5E+01	Max	(2)	3.4E+00	Mean	(2)
Ethylbenzene	ug/L	1.5E+02	(2)	9.4E+02	D	ug/L	9.4E+02	Max	(2)	2.5E+01	Mean	(2)
1,1,2,2-Tetrachloroethane	ug/L	1.9E+00	(2)	1.9E+00	J	ug/L	1.9E+00	Max	(2)	1.5E+00	Mean	(2)
n-Propylbenzene	ug/L	1.9E+01	(2)	4.3E+01		ug/L	4.3E+01	Max	(2)	4.3E+00	Mean	(2)
1,3,5-Trimethylbenzene	ug/L	8.1E+01	(2)	2.0E+02		ug/L	2.0E+02	Max	(2)	1.4E+01	Mean	(2)

TABLE 3.9
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Medium: Groundwater
Medium Description: Aquifer
Exposure Medium: Groundwater
Exposure Point: Tap Water

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
1,2,4-Trimethylbenzene	ug/L	1.4E+02	(2)	4.6E+02	D	ug/L	4.6E+02	Max	(2)	3.4E+01	Mean	(2)
sec-Butylbenzene	ug/L	6.7E+00	(2)	1.5E+01		ug/L	1.5E+01	Max	(2)	2.0E+00	Mean	(2)
p-Isopropyltoluene (1)	ug/L	6.1E+00	(2)	1.5E+01		ug/L	1.5E+01	Max	(2)	1.9E+00	Mean	(2)
n-Butylbenzene (1)	ug/L	4.5E+00	(2)	5.0E+00		ug/L	5.0E+00	Max	(2)	1.5E+00	Mean	(2)
1,2-Dichlorobenzene	ug/L	9.5E+00	(2)	2.2E+01		ug/L	2.2E+01	Max	(2)	2.4E+00	Mean	(2)
Naphthalene	ug/L	7.1E+01	(2)	2.1E+02		ug/L	2.1E+02	Max	(2)	1.8E+01	Mean	(2)
2-Methylnaphthalene	ug/L	1.8E+01	(2)	3.7E+01			3.7E+01	Max	(2)	1.0E+01	Mean	(2)
C9-C10 Aromatics	ug/L	4.8E+02	(2)	7.8E+02		ug/L	7.8E+02	Max	(2)	2.2E+02	Mean	(2)
C10-C22 Aromatics	ug/L	1.5E+02	(2)	2.2E+02		ug/L	2.2E+02	Max	(2)	6.8E+01	Mean	(2)
Aldrin	ug/L	1.9E-02	(2)	4.7E-02		ug/L	4.7E-02	Max	(2)	1.5E-02	Mean	(2)
Alpha-BHC (hexachlorocylcohexane (HCH))	ug/L	1.5E-02	(2)	2.6E-02		ug/L	2.6E-02	Max	(2)	7.1E-03	Mean	(2)
Gamma-BHC (hexachlorocylcohexane (HCH), lindane)	ug/L	3.5E-02	(2)	7.6E-02		ug/L	7.6E-02	Max	(2)	1.6E-02	Mean	(2)
Heptachlor	ug/L	2.7E-02	(2)	4.1E-02		ug/L	4.1E-02	Max	(2)	9.4E-03	Mean	(2)
Heptachlor epoxide	ug/L	6.8E-03	(2)	2.0E-02		ug/L	2.0E-02	Max	(2)	6.1E-03	Mean	(2)
Dieldrin	ug/L	2.5E-02	(2)	4.7E-02		ug/L	4.7E-02	Max	(2)	1.2E-02	Mean	(2)

For compounds that were not detected, 1/2 detection limit was used as a proxy concentration to calculate the CT EPC and the 95% UCL. Duplicate sample results were averaged.
Only detected concentrations were used to calculate the arithmetic mean.
The maximum dioxin TEQ calculated from the EPCs in this table may differ from the maximum dioxin TEQ in Table 2 because dioxin, furan and dioxin-like PCB congeners that were never detected are not included in this table.
Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Ln-transformed Data (95% UCL-T); Mean of Ln-transformed Data (Mean-T); Mean of Normal Data (Mean-N).
(1) These compounds have been included as COPCs because the sum of the maximum concentrations of the following compounds exceed the NHDES ambient groundwater quality standard for alkylbenzenes of 50 ug/L: 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, n-propyl benzene, n-butyl benzene, 4-isopropyltoluene, tert-butyl benzene, and sec-butyl benzene. Tert-butyl benzene was not detected, therefore, it is not shown in this table.
(2) Following USEPA Region I Guidance, we assume that, in the future, a private well can be placed anywhere on the site. Therefore, the use of the 95% UCL is not applicable to the assessment of exposure to groundwater and we use the maximum detected concentration for the RME and the arithmetic average concentration for the CT.

References:

USEPA. 1994. Risk Updates, no. 2. United States Environmental Protection Agency, Region One, Waste Management Division. August 1994.
USEPA. 1992. Supplemental Guidance to RAGS: Calculating the Concentration Term. United States Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C. Intermittent Bulletin, vol. 1, no. 1. May 1992.

TABLE 3.10
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Medium: Soil
Medium Description: Parcel 1 and Parcel 2 soil, 0 to 10 feet
Exposure Medium: Surface and Subsurface Soil
Exposure Point: 0 to 10 foot soil

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Antimony	ug/kg	8.7E+02	7.4E+02	1.9E+04	J	ug/kg	7.4E+02	95% UCL-T	W - Test (1)	7.4E+02	95% UCL-T	W - Test (1)
Arsenic	ug/kg	6.2E+03	6.6E+03	2.2E+04	J	ug/kg	6.6E+03	95% UCL-T	W - Test (1)	6.6E+03	95% UCL-T	W - Test (1)
Barium	ug/kg	9.1E+04	7.8E+04	3.2E+06	J	ug/kg	7.8E+04	95% UCL-T	W - Test (1)	7.8E+04	95% UCL-T	W - Test (1)
Beryllium	ug/kg	4.0E+02	(2)	1.8E+03		ug/kg	1.8E+03	Max	(2)	4.0E+02	Mean	(2)
Cadmium	ug/kg	1.4E+03	(2)	4.4E+04		ug/kg	4.4E+04	Max	(2)	1.3E+03	Mean	(2)
Chromium	ug/kg	2.6E+04	(2)	5.3E+05		ug/kg	5.3E+05	Max	(2)	2.6E+04	Mean	(2)
Copper	ug/kg	5.8E+04	4.7E+04	1.8E+06	J	ug/kg	4.7E+04	95% UCL-T	W - Test (1)	4.7E+04	95% UCL-T	W - Test (1)
Lead	ug/kg	4.3E+05	4.9E+05	2.0E+07		ug/kg	4.9E+05	95% UCL-T	W - Test (1)	4.9E+05	95% UCL-T	W - Test (1)
Manganese	ug/kg	1.6E+05	(2)	1.1E+06	J	ug/kg	1.1E+06	Max	(2)	1.6E+05	Mean	(2)
Mercury (Piles 5A & 5B)	ug/kg	6.1E+03	3.9E+04	2.4E+04	J	ug/kg	2.4E+04	Max	(4)	6.1E+03	Mean	(4)
Nickel	ug/kg	2.3E+04	(2)	9.2E+05		ug/kg	9.2E+05	Max	(2)	2.3E+04	Mean	(2)
Vanadium	ug/kg	1.7E+04	1.8E+04	5.8E+04	J	ug/kg	1.8E+04	95% UCL-T	W - Test (1)	1.8E+04	95% UCL-T	W - Test (1)
Zinc	ug/kg	1.2E+05	1.3E+05	1.7E+06		ug/kg	1.3E+05	95% UCL-T	W - Test (1)	1.3E+05	95% UCL-T	W - Test (1)
Molybdenum	ug/kg	3.4E+03	(2)	9.3E+04	J	ug/kg	9.3E+04	Max	(2)	2.4E+03	Mean	(2)
cis-1,2-Dichloroethene	ug/kg	1.9E+03	(3)	1.1E+04		ug/kg	1.1E+04	Max	(3)	1.8E+02	Mean	(3)
Tetrachloroethene	ug/kg	3.5E+02	1.3E+02	2.3E+03		ug/kg	1.3E+02	95% UCL-T	W - Test (1)	1.3E+02	95% UCL-T	W - Test (1)
n-Propylbenzene	ug/kg	2.6E+03	2.1E+02	2.5E+04		ug/kg	2.1E+02	95% UCL-T	W - Test (1)	2.1E+02	95% UCL-T	W - Test (1)
1,3,5-Trimethylbenzene	ug/kg	8.8E+03	7.4E+02	8.4E+04		ug/kg	7.4E+02	95% UCL-T	W - Test (1)	7.4E+02	95% UCL-T	W - Test (1)
1,2,4-Trimethylbenzene	ug/kg	1.7E+04	2.8E+03	1.9E+05		ug/kg	2.8E+03	95% UCL-T	W - Test (1)	2.8E+03	95% UCL-T	W - Test (1)
sec-Butylbenzene	ug/kg	9.4E+02	1.8E+02	6.0E+03		ug/kg	1.8E+02	95% UCL-T	W - Test (1)	1.8E+02	95% UCL-T	W - Test (1)
p-Isopropyltoluene	ug/kg	5.3E+02	1.9E+02	3.5E+03		ug/kg	1.9E+02	95% UCL-T	W - Test (1)	1.9E+02	95% UCL-T	W - Test (1)
Naphthalene	ug/kg	9.5E+02	8.0E+02	2.2E+04		ug/kg	8.0E+02	95% UCL-T	W - Test (1)	8.0E+02	95% UCL-T	W - Test (1)
Benz(a)anthracene	ug/kg	5.4E+02	8.8E+02	4.2E+03	J	ug/kg	8.8E+02	95% UCL-T	W - Test (1)	8.8E+02	95% UCL-T	W - Test (1)
Chrysene	ug/kg	5.6E+02	7.5E+02	7.2E+03	J	ug/kg	7.5E+02	95% UCL-T	W - Test (1)	7.5E+02	95% UCL-T	W - Test (1)
Benzo(b)fluoranthene	ug/kg	3.4E+02	5.4E+02	1.6E+03	J	ug/kg	5.4E+02	95% UCL-T	W - Test (1)	5.4E+02	95% UCL-T	W - Test (1)
Benzo(k)fluoranthene	ug/kg	3.3E+02	(2)	1.7E+03	J	ug/kg	1.7E+03	Max	(2)	3.3E+02	Mean	(2)
Benzo(a)pyrene	ug/kg	3.9E+02	(2)	2.0E+03	J	ug/kg	2.0E+03	Max	(2)	3.7E+02	Mean	(2)
Indeno(1,2,3-cd)pyrene	ug/kg	2.4E+02	3.6E+02	1.2E+03	J	ug/kg	3.6E+02	95% UCL-T	W - Test (1)	3.6E+02	95% UCL-T	W - Test (1)
Dibenz(a,h,)anthracene	ug/kg	6.8E+01	2.2E+02	2.8E+02	J	ug/kg	2.2E+02	95% UCL-T	W - Test (1)	2.2E+02	95% UCL-T	W - Test (1)
bis(2-Ethylhexyl)phthalate	ug/kg	1.4E+04	3.4E+04	1.3E+05		ug/kg	3.4E+04	95% UCL-T	W - Test (1)	3.4E+04	95% UCL-T	W - Test (1)
C9-C18 Aliphatics	ug/kg	3.8E+05	1.1E+06	4.6E+06		ug/kg	1.1E+06	95% UCL-T	W - Test (1)	1.1E+06	95% UCL-T	W - Test (1)
C11-C22 Aromatics	ug/kg	4.6E+05	6.6E+05	8.2E+06		ug/kg	6.6E+05	95% UCL-T	W - Test (1)	6.6E+05	95% UCL-T	W - Test (1)
PCB-77	ug/kg	2.8E+02	3.2E+03	3.0E+03	D	ug/kg	3.0E+03	Max	(4)	2.8E+02	Mean	(4)
PCB-81	ug/kg	1.4E+01	5.3E+01	9.8E+01		ug/kg	5.3E+01	95% UCL-T	W - Test (1)	5.3E+01	95% UCL-T	W - Test (1)
PCB-118	ug/kg	7.1E+02	3.3E+03	7.2E+03	DJ	ug/kg	3.3E+03	95% UCL-T	W - Test (1)	3.3E+03	95% UCL-T	W - Test (1)
PCB-123	ug/kg	8.2E+01	1.8E+02	7.4E+02	D	ug/kg	1.8E+02	95% UCL-T	W - Test (1)	1.8E+02	95% UCL-T	W - Test (1)

TABLE 3.10
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Medium: Soil
Medium Description: Parcel 1 and Parcel 2 soil, 0 to 10 feet
Exposure Medium: Surface and Subsurface Soil
Exposure Point: 0 to 10 foot soil

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
PCB-105	ug/kg	4.1E+02	2.2E+03	4.4E+03	D	ug/kg	2.2E+03	95% UCL-T	W - Test (1)	2.2E+03	95% UCL-T	W - Test (1)
PCB-114	ug/kg	4.2E+01	1.4E+02	4.4E+02	D	ug/kg	1.4E+02	95% UCL-T	W - Test (1)	1.4E+02	95% UCL-T	W - Test (1)
PCB-126	ug/kg	3.8E+00	7.6E+00	2.8E+01		ug/kg	7.6E+00	95% UCL-T	W - Test (1)	7.6E+00	95% UCL-T	W - Test (1)
PCB-128/167	ug/kg	5.2E+01	8.7E+01	4.2E+02	D	ug/kg	8.7E+01	95% UCL-T	W - Test (1)	8.7E+01	95% UCL-T	W - Test (1)
PCB-156	ug/kg	2.5E+01	5.0E+01	2.2E+02	D	ug/kg	5.0E+01	95% UCL-T	W - Test (1)	5.0E+01	95% UCL-T	W - Test (1)
PCB-157	ug/kg	5.9E+00	1.1E+01	5.4E+01		ug/kg	1.1E+01	95% UCL-T	W - Test (1)	1.1E+01	95% UCL-T	W - Test (1)
PCB-189	ug/kg	1.7E+00	3.0E+00	8.3E+00		ug/kg	3.0E+00	95% UCL-T	W - Test (1)	3.0E+00	95% UCL-T	W - Test (1)
2,3,7,8-TCDD	ug/kg	3.0E-04	(3)	3.9E-04	J	ug/kg	3.9E-04	Max	(3)	3.0E-04	Mean	(3)
1,2,3,7,8-PeCDD	ug/kg	1.8E-03	(3)	3.6E-03		ug/kg	3.6E-03	Max	(3)	1.8E-03	Mean	(3)
1,2,3,4,7,8-HxCDD	ug/kg	2.9E-03	(3)	5.1E-03		ug/kg	5.1E-03	Max	(3)	2.9E-03	Mean	(3)
1,2,3,6,7,8-HxCDD	ug/kg	7.7E-03	(3)	1.2E-02		ug/kg	1.2E-02	Max	(3)	7.7E-03	Mean	(3)
1,2,3,7,8,9-HxCDD	ug/kg	5.7E-03	(3)	1.0E-02		ug/kg	1.0E-02	Max	(3)	5.7E-03	Mean	(3)
1,2,3,4,6,7,8-HpCDD	ug/kg	1.3E-01	(3)	2.5E-01		ug/kg	2.5E-01	Max	(3)	1.3E-01	Mean	(3)
OCDD	ug/kg	1.0E+00	(3)	2.0E+00		ug/kg	2.0E+00	Max	(3)	1.0E+00	Mean	(3)
2,3,7,8-TDCF	ug/kg	2.0E-02	(3)	5.9E-02		ug/kg	5.9E-02	Max	(3)	2.0E-02	Mean	(3)
1,2,3,7,8,-PeCDF	ug/kg	7.7E-03	(3)	2.2E-02		ug/kg	2.2E-02	Max	(3)	7.7E-03	Mean	(3)
2,3,4,7,8,-PeCDF	ug/kg	5.5E-02	(3)	1.4E-01		ug/kg	1.4E-01	Max	(3)	5.5E-02	Mean	(3)
1,2,3,4,7,8-HxCDF	ug/kg	1.5E-02	(3)	3.2E-02		ug/kg	3.2E-02	Max	(3)	1.5E-02	Mean	(3)
1,2,3,6,7,8-HxCDF	ug/kg	8.8E-03	(3)	1.9E-02	J+	ug/kg	1.9E-02	Max	(3)	8.8E-03	Mean	(3)
2,3,4,6,7,8-HxCDF	ug/kg	1.0E-02	(3)	2.1E-02		ug/kg	2.1E-02	Max	(3)	1.0E-02	Mean	(3)
1,2,3,7,8,9-HxCDF	ug/kg	4.3E-03	(3)	1.1E-02		ug/kg	1.1E-02	Max	(3)	4.3E-03	Mean	(3)
1,2,3,4,6,7,8-HpCDF	ug/kg	3.4E-02	(3)	6.3E-02		ug/kg	6.3E-02	Max	(3)	3.4E-02	Mean	(3)
1,2,3,4,7,8,9-HpCDF	ug/kg	3.8E-03	(3)	7.8E-03		ug/kg	7.8E-03	Max	(3)	3.8E-03	Mean	(3)
OCDF	ug/kg	5.2E-02	(3)	1.0E-01		ug/kg	1.0E-01	Max	(3)	5.2E-02	Mean	(3)
PCBs (total)	ug/kg	3.5E+04	9.8E+04	6.8E+05		ug/kg	9.8E+04	95% UCL-T	W - Test (1)	9.8E+04	95% UCL-T	W - Test (1)
PCBs (minus dioxin-like congeners)	ug/kg	3.4E+04	8.0E+04	6.7E+05		ug/kg	8.0E+04	95% UCL-T	W - Test (1)	8.0E+04	95% UCL-T	W - Test (1)

For compounds that were not detected, 1/2 detection limit was used as a proxy concentration to calculate the CT EPC and the 95% UCL. Duplicate sample results were averaged.
Only detected concentrations were used to calculate the arithmetic mean.
The maximum dioxin TEQ calculated from the EPCs in this table may differ from the maximum dioxin TEQ in Table 2 because dioxin, furan and dioxin-like PCB congeners that were never detected are not included in this table.
Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Ln-transformed Data (95% UCL-T); Mean of Ln-transformed Data (Mean-T); Mean of Normal Data (Mean-N).
(1) Shapiro-Wilk W Test indicates that data are log-normally distributed ($\alpha = 0.01$). Only detected concentrations were included in the distribution test.
(2) Data are not log-normally or normally distributed. We use the maximum detected concentration for the RME and the arithmetic average concentration for the CT.
(3) There are less than ten detected concentrations; therefore, we did not test the distribution shape of the data. We use the maximum detected concentration for the RME and the arithmetic average concentration for the CT.
(4) The 95% UCL is greater than the maximum detected concentration, therefore, we use the maximum detected concentration for the RME and the arithmetic average concentration for the CT.

TABLE 3.10
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Medium: Soil
Medium Description: Parcel 1 and Parcel 2 soil, 0 to 10 feet
Exposure Medium: Surface and Subsurface Soil
Exposure Point: 0 to 10 foot soil

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale

References:

USEPA. 1994. Risk Updates, no. 2. United States Environmental Protection Agency, Region One, Waste Management Division. August 1994.

USEPA. 1992. Supplemental Guidance to RAGS: Calculating the Concentration Term. United States Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C. Intermittent Bulletin, vol. 1, no. 1. May 1992.

TABLE 3.11
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Medium: Soil
Medium Description: Parcel 1 and Parcel 2 soil, 0 to 10 feet
Exposure Medium: Surface and Subsurface Soil
Exposure Point: 0 to 10 foot soil at excavation site

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Antimony	ug/kg	8.7E+02	7.4E+02	1.9E+04	J	ug/kg	7.4E+02	95% UCL-T	W - Test (1)	7.4E+02	95% UCL-T	W - Test (1)
Arsenic	ug/kg	6.2E+03	6.6E+03	2.2E+04	J	ug/kg	6.6E+03	95% UCL-T	W - Test (1)	6.6E+03	95% UCL-T	W - Test (1)
Barium	ug/kg	9.1E+04	7.8E+04	3.2E+06	J	ug/kg	7.8E+04	95% UCL-T	W - Test (1)	7.8E+04	95% UCL-T	W - Test (1)
Beryllium	ug/kg	4.0E+02	(2)	1.8E+03		ug/kg	1.8E+03	Max	(2)	4.0E+02	Mean	(2)
Cadmium	ug/kg	1.4E+03	(2)	4.4E+04		ug/kg	4.4E+04	Max	(2)	1.3E+03	Mean	(2)
Chromium	ug/kg	2.6E+04	(2)	5.3E+05		ug/kg	5.3E+05	Max	(2)	2.6E+04	Mean	(2)
Lead	ug/kg	4.3E+05	4.9E+05	2.0E+07		ug/kg	4.9E+05	95% UCL-T	W - Test (1)	4.9E+05	95% UCL-T	W - Test (1)
Mercury (Piles 5A & 5B)	ug/kg	6.1E+03	3.9E+04	2.4E+04	J	ug/kg	2.4E+04	Max	(4)	6.1E+03	Mean	(4)
Nickel	ug/kg	2.3E+04	(2)	9.2E+05		ug/kg	9.2E+05	Max	(2)	2.3E+04	Mean	(2)
Zinc	ug/kg	1.2E+05	1.3E+05	1.7E+06		ug/kg	1.3E+05	95% UCL-T	W - Test (1)	1.3E+05	95% UCL-T	W - Test (1)
cis-1,2-Dichloroethene	ug/kg	1.9E+03	(3)	1.1E+04		ug/kg	1.1E+04	Max	(3)	1.8E+02	Mean	(3)
Tetrachloroethene	ug/kg	3.5E+02	1.3E+02	2.3E+03		ug/kg	1.3E+02	95% UCL-T	W - Test (1)	1.3E+02	95% UCL-T	W - Test (1)
n-Propylbenzene	ug/kg	2.6E+03	2.1E+02	2.5E+04		ug/kg	2.1E+02	95% UCL-T	W - Test (1)	2.1E+02	95% UCL-T	W - Test (1)
1,3,5-Trimethylbenzene	ug/kg	8.8E+03	7.4E+02	8.4E+04		ug/kg	7.4E+02	95% UCL-T	W - Test (1)	7.4E+02	95% UCL-T	W - Test (1)
1,2,4-Trimethylbenzene	ug/kg	1.7E+04	2.8E+03	1.9E+05		ug/kg	2.8E+03	95% UCL-T	W - Test (1)	2.8E+03	95% UCL-T	W - Test (1)
sec-Butylbenzene	ug/kg	9.4E+02	1.8E+02	6.0E+03		ug/kg	1.8E+02	95% UCL-T	W - Test (1)	1.8E+02	95% UCL-T	W - Test (1)
p-Isopropyltoluene	ug/kg	5.3E+02	1.9E+02	3.5E+03		ug/kg	1.9E+02	95% UCL-T	W - Test (1)	1.9E+02	95% UCL-T	W - Test (1)
Naphthalene	ug/kg	9.5E+02	8.0E+02	2.2E+04		ug/kg	8.0E+02	95% UCL-T	W - Test (1)	8.0E+02	95% UCL-T	W - Test (1)
Benz(a)anthracene	ug/kg	5.4E+02	8.8E+02	4.2E+03	J	ug/kg	8.8E+02	95% UCL-T	W - Test (1)	8.8E+02	95% UCL-T	W - Test (1)
Chrysene	ug/kg	5.6E+02	7.5E+02	7.2E+03	J	ug/kg	7.5E+02	95% UCL-T	W - Test (1)	7.5E+02	95% UCL-T	W - Test (1)
Benzo(b)fluoranthene	ug/kg	3.4E+02	5.4E+02	1.6E+03	J	ug/kg	5.4E+02	95% UCL-T	W - Test (1)	5.4E+02	95% UCL-T	W - Test (1)
Benzo(k)fluoranthene	ug/kg	3.3E+02	(2)	1.7E+03	J	ug/kg	1.7E+03	Max	(2)	3.3E+02	Mean	(2)
Benzo(a)pyrene	ug/kg	3.9E+02	(2)	2.0E+03	J	ug/kg	2.0E+03	Max	(2)	3.7E+02	Mean	(2)
Indeno(1,2,3-cd)pyrene	ug/kg	2.4E+02	3.6E+02	1.2E+03	J	ug/kg	3.6E+02	95% UCL-T	W - Test (1)	3.6E+02	95% UCL-T	W - Test (1)
Dibenz(a,h,)anthracene	ug/kg	6.8E+01	2.2E+02	2.8E+02	J	ug/kg	2.2E+02	95% UCL-T	W - Test (1)	2.2E+02	95% UCL-T	W - Test (1)
bis(2-Ethylhexyl)phthalate	ug/kg	1.4E+04	3.4E+04	1.3E+05		ug/kg	3.4E+04	95% UCL-T	W - Test (1)	3.4E+04	95% UCL-T	W - Test (1)
C9-C18 Aliphatics	ug/kg	3.8E+05	1.1E+06	4.6E+06		ug/kg	1.1E+06	95% UCL-T	W - Test (1)	1.1E+06	95% UCL-T	W - Test (1)
C11-C22 Aromatics	ug/kg	4.6E+05	6.6E+05	8.2E+06		ug/kg	6.6E+05	95% UCL-T	W - Test (1)	6.6E+05	95% UCL-T	W - Test (1)
PCB-77	ug/kg	2.8E+02	3.2E+03	3.0E+03	D	ug/kg	3.0E+03	Max	(4)	2.8E+02	Mean	(4)
PCB-81	ug/kg	1.4E+01	5.3E+01	9.8E+01		ug/kg	5.3E+01	95% UCL-T	W - Test (1)	5.3E+01	95% UCL-T	W - Test (1)
PCB-118	ug/kg	7.1E+02	3.3E+03	7.2E+03	DJ	ug/kg	3.3E+03	95% UCL-T	W - Test (1)	3.3E+03	95% UCL-T	W - Test (1)
PCB-123	ug/kg	8.2E+01	1.8E+02	7.4E+02	D	ug/kg	1.8E+02	95% UCL-T	W - Test (1)	1.8E+02	95% UCL-T	W - Test (1)
PCB-105	ug/kg	4.1E+02	2.2E+03	4.4E+03	D	ug/kg	2.2E+03	95% UCL-T	W - Test (1)	2.2E+03	95% UCL-T	W - Test (1)
PCB-114	ug/kg	4.2E+01	1.4E+02	4.4E+02	D	ug/kg	1.4E+02	95% UCL-T	W - Test (1)	1.4E+02	95% UCL-T	W - Test (1)
PCB-126	ug/kg	3.8E+00	7.6E+00	2.8E+01		ug/kg	7.6E+00	95% UCL-T	W - Test (1)	7.6E+00	95% UCL-T	W - Test (1)
PCB-128/167	ug/kg	5.2E+01	8.7E+01	4.2E+02	D	ug/kg	8.7E+01	95% UCL-T	W - Test (1)	8.7E+01	95% UCL-T	W - Test (1)
PCB-156	ug/kg	2.5E+01	5.0E+01	2.2E+02	D	ug/kg	5.0E+01	95% UCL-T	W - Test (1)	5.0E+01	95% UCL-T	W - Test (1)
PCB-157	ug/kg	5.9E+00	1.1E+01	5.4E+01		ug/kg	1.1E+01	95% UCL-T	W - Test (1)	1.1E+01	95% UCL-T	W - Test (1)
PCB-189	ug/kg	1.7E+00	3.0E+00	8.3E+00		ug/kg	3.0E+00	95% UCL-T	W - Test (1)	3.0E+00	95% UCL-T	W - Test (1)

TABLE 3.11
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Medium: Soil
Medium Description: Parcel 1 and Parcel 2 soil, 0 to 10 feet
Exposure Medium: Surface and Subsurface Soil
Exposure Point: 0 to 10 foot soil at excavation site

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
2,3,7,8-TCDD	ug/kg	3.0E-04	(3)	3.9E-04	J	ug/kg	3.9E-04	Max	(3)	3.0E-04	Mean	(3)
1,2,3,7,8-PeCDD	ug/kg	1.8E-03	(3)	3.6E-03		ug/kg	3.6E-03	Max	(3)	1.8E-03	Mean	(3)
1,2,3,4,7,8-HxCDD	ug/kg	2.9E-03	(3)	5.1E-03		ug/kg	5.1E-03	Max	(3)	2.9E-03	Mean	(3)
1,2,3,6,7,8-HxCDD	ug/kg	7.7E-03	(3)	1.2E-02		ug/kg	1.2E-02	Max	(3)	7.7E-03	Mean	(3)
1,2,3,7,8,9-HxCDD	ug/kg	5.7E-03	(3)	1.0E-02		ug/kg	1.0E-02	Max	(3)	5.7E-03	Mean	(3)
1,2,3,4,6,7,8-HpCDD	ug/kg	1.3E-01	(3)	2.5E-01		ug/kg	2.5E-01	Max	(3)	1.3E-01	Mean	(3)
OCDD	ug/kg	1.0E+00	(3)	2.0E+00		ug/kg	2.0E+00	Max	(3)	1.0E+00	Mean	(3)
2,3,7,8-TDCF	ug/kg	2.0E-02	(3)	5.9E-02		ug/kg	5.9E-02	Max	(3)	2.0E-02	Mean	(3)
1,2,3,7,8,-PeCDF	ug/kg	7.7E-03	(3)	2.2E-02		ug/kg	2.2E-02	Max	(3)	7.7E-03	Mean	(3)
2,3,4,7,8,-PeCDF	ug/kg	5.5E-02	(3)	1.4E-01		ug/kg	1.4E-01	Max	(3)	5.5E-02	Mean	(3)
1,2,3,4,7,8-HxCDF	ug/kg	1.5E-02	(3)	3.2E-02		ug/kg	3.2E-02	Max	(3)	1.5E-02	Mean	(3)
1,2,3,6,7,8-HxCDF	ug/kg	8.8E-03	(3)	1.9E-02	J+	ug/kg	1.9E-02	Max	(3)	8.8E-03	Mean	(3)
2,3,4,6,7,8-HxCDF	ug/kg	1.0E-02	(3)	2.1E-02		ug/kg	2.1E-02	Max	(3)	1.0E-02	Mean	(3)
1,2,3,7,8,9-HxCDF	ug/kg	4.3E-03	(3)	1.1E-02		ug/kg	1.1E-02	Max	(3)	4.3E-03	Mean	(3)
1,2,3,4,6,7,8-HpCDF	ug/kg	3.4E-02	(3)	6.3E-02		ug/kg	6.3E-02	Max	(3)	3.4E-02	Mean	(3)
1,2,3,4,7,8,9-HpCDF	ug/kg	3.8E-03	(3)	7.8E-03		ug/kg	7.8E-03	Max	(3)	3.8E-03	Mean	(3)
OCDF	ug/kg	5.2E-02	(3)	1.0E-01		ug/kg	1.0E-01	Max	(3)	5.2E-02	Mean	(3)
PCBs (total)	ug/kg	3.5E+04	9.8E+04	6.8E+05		ug/kg	9.8E+04	95% UCL-T	W - Test (1)	9.8E+04	95% UCL-T	W - Test (1)
PCBs (minus dioxin-like congeners)	ug/kg	3.4E+04	8.0E+04	6.7E+05		ug/kg	8.0E+04	95% UCL-T	W - Test (1)	8.0E+04	95% UCL-T	W - Test (1)

For compounds that were not detected, 1/2 detection limit was used as a proxy concentration to calculate the CT EPC and the 95% UCL. Duplicate sample results were averaged.
Only detected concentrations were used to calculate the arithmetic mean.
The maximum dioxin TEQ calculated from the EPCs in this table may differ from the maximum dioxin TEQ in Table 2 because dioxin, furan and dioxin-like PCB congeners that were never detected are not included in this table.
Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Ln-transformed Data (95% UCL-T); Mean of Ln-transformed Data (Mean-T); Mean of Normal Data (Mean-N).
(1) Shapiro-Wilk W Test indicates that data are log-normally distributed ($\alpha = 0.01$). Only detected concentrations were included in the distribution test.
(2) Data are not log-normally or normally distributed. We use the maximum detected concentration for the RME and the arithmetic average concentration for the CT.
(3) There are less than ten detected concentrations; therefore, we did not test the distribution shape of the data. We use the maximum detected concentration for the RME and the arithmetic average concentration for the CT.
(4) The 95% UCL is greater than the maximum detected concentration, therefore, we use the maximum detected concentration for the RME and the arithmetic average concentration for the CT.

References:

USEPA. 1994. Risk Updates, no. 2. United States Environmental Protection Agency, Region One, Waste Management Division. August 1994.
USEPA. 1992. Supplemental Guidance to RAGS: Calculating the Concentration Term. United States Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C. Intermittent Bulletin, vol. 1, no. 1. May 1992.

TABLE 3.12
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Medium: Soil
Medium Description: Parcel 1 and Parcel 2 soil, 0 to 10 feet
Exposure Medium: Particulates
Exposure Point: Fugitive Dust

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Antimony	ug/kg	8.7E+02	7.4E+02	1.9E+04	J	ug/kg	7.4E+02	95% UCL-T	W - Test (1)	7.4E+02	95% UCL-T	W - Test (1)
Arsenic	ug/kg	6.2E+03	6.6E+03	2.2E+04	J	ug/kg	6.6E+03	95% UCL-T	W - Test (1)	6.6E+03	95% UCL-T	W - Test (1)
Barium	ug/kg	9.1E+04	7.8E+04	3.2E+06	J	ug/kg	7.8E+04	95% UCL-T	W - Test (1)	7.8E+04	95% UCL-T	W - Test (1)
Beryllium	ug/kg	4.0E+02	(2)	1.8E+03		ug/kg	1.8E+03	Max	(2)	4.0E+02	Mean	(2)
Cadmium	ug/kg	1.4E+03	(2)	4.4E+04		ug/kg	4.4E+04	Max	(2)	1.3E+03	Mean	(2)
Chromium	ug/kg	2.6E+04	(2)	5.3E+05		ug/kg	5.3E+05	Max	(2)	2.6E+04	Mean	(2)
Copper	ug/kg	5.8E+04	4.7E+04	1.8E+06	J	ug/kg	4.7E+04	95% UCL-T	W - Test (1)	4.7E+04	95% UCL-T	W - Test (1)
Lead	ug/kg	4.3E+05	4.9E+05	2.0E+07		ug/kg	4.9E+05	95% UCL-T	W - Test (1)	4.9E+05	95% UCL-T	W - Test (1)
Manganese	ug/kg	1.6E+05	(2)	1.1E+06	J	ug/kg	1.1E+06	Max	(2)	1.6E+05	Mean	(2)
Mercury (Piles 5A & 5B)	ug/kg	6.1E+03	3.9E+04	2.4E+04	J	ug/kg	2.4E+04	Max	(4)	6.1E+03	Mean	(4)
Nickel	ug/kg	2.3E+04	(2)	9.2E+05		ug/kg	9.2E+05	Max	(2)	2.3E+04	Mean	(2)
Vanadium	ug/kg	1.7E+04	1.8E+04	5.8E+04	J	ug/kg	1.8E+04	95% UCL-T	W - Test (1)	1.8E+04	95% UCL-T	W - Test (1)
Zinc	ug/kg	1.2E+05	1.3E+05	1.7E+06		ug/kg	1.3E+05	95% UCL-T	W - Test (1)	1.3E+05	95% UCL-T	W - Test (1)
Molybdenum	ug/kg	3.4E+03	(2)	9.3E+04	J	ug/kg	9.3E+04	Max	(2)	2.4E+03	Mean	(2)
cis-1,2-Dichloroethene	ug/kg	1.9E+03	(3)	1.1E+04		ug/kg	1.1E+04	Max	(3)	1.8E+02	Mean	(3)
Tetrachloroethene	ug/kg	3.5E+02	1.3E+02	2.3E+03		ug/kg	1.3E+02	95% UCL-T	W - Test (1)	1.3E+02	95% UCL-T	W - Test (1)
n-Propylbenzene	ug/kg	2.6E+03	2.1E+02	2.5E+04		ug/kg	2.1E+02	95% UCL-T	W - Test (1)	2.1E+02	95% UCL-T	W - Test (1)
1,3,5-Trimethylbenzene	ug/kg	8.8E+03	7.4E+02	8.4E+04		ug/kg	7.4E+02	95% UCL-T	W - Test (1)	7.4E+02	95% UCL-T	W - Test (1)
1,2,4-Trimethylbenzene	ug/kg	1.7E+04	2.8E+03	1.9E+05		ug/kg	2.8E+03	95% UCL-T	W - Test (1)	2.8E+03	95% UCL-T	W - Test (1)
sec-Butylbenzene	ug/kg	9.4E+02	1.8E+02	6.0E+03		ug/kg	1.8E+02	95% UCL-T	W - Test (1)	1.8E+02	95% UCL-T	W - Test (1)
p-Isopropyltoluene	ug/kg	5.3E+02	1.9E+02	3.5E+03		ug/kg	1.9E+02	95% UCL-T	W - Test (1)	1.9E+02	95% UCL-T	W - Test (1)
Naphthalene	ug/kg	9.5E+02	8.0E+02	2.2E+04		ug/kg	8.0E+02	95% UCL-T	W - Test (1)	8.0E+02	95% UCL-T	W - Test (1)
Benz(a)anthracene	ug/kg	5.4E+02	8.8E+02	4.2E+03	J	ug/kg	8.8E+02	95% UCL-T	W - Test (1)	8.8E+02	95% UCL-T	W - Test (1)
Chrysene	ug/kg	5.6E+02	7.5E+02	7.2E+03	J	ug/kg	7.5E+02	95% UCL-T	W - Test (1)	7.5E+02	95% UCL-T	W - Test (1)
Benzo(b)fluoranthene	ug/kg	3.4E+02	5.4E+02	1.6E+03	J	ug/kg	5.4E+02	95% UCL-T	W - Test (1)	5.4E+02	95% UCL-T	W - Test (1)
Benzo(k)fluoranthene	ug/kg	3.3E+02	(2)	1.7E+03	J	ug/kg	1.7E+03	Max	(2)	3.3E+02	Mean	(2)
Benzo(a)pyrene	ug/kg	3.9E+02	(2)	2.0E+03	J	ug/kg	2.0E+03	Max	(2)	3.7E+02	Mean	(2)
Indeno(1,2,3-cd)pyrene	ug/kg	2.4E+02	3.6E+02	1.2E+03	J	ug/kg	3.6E+02	95% UCL-T	W - Test (1)	3.6E+02	95% UCL-T	W - Test (1)
Dibenz(a,h,)anthracene	ug/kg	6.8E+01	2.2E+02	2.8E+02	J	ug/kg	2.2E+02	95% UCL-T	W - Test (1)	2.2E+02	95% UCL-T	W - Test (1)
bis(2-Ethylhexyl)phthalate	ug/kg	1.4E+04	3.4E+04	1.3E+05		ug/kg	3.4E+04	95% UCL-T	W - Test (1)	3.4E+04	95% UCL-T	W - Test (1)
C9-C18 Aliphatics	ug/kg	3.8E+05	1.1E+06	4.6E+06		ug/kg	1.1E+06	95% UCL-T	W - Test (1)	1.1E+06	95% UCL-T	W - Test (1)
C11-C22 Aromatics	ug/kg	4.6E+05	6.6E+05	8.2E+06		ug/kg	6.6E+05	95% UCL-T	W - Test (1)	6.6E+05	95% UCL-T	W - Test (1)
PCB-77	ug/kg	2.8E+02	3.2E+03	3.0E+03	D	ug/kg	3.0E+03	Max	(4)	2.8E+02	Mean	(4)
PCB-81	ug/kg	1.4E+01	5.3E+01	9.8E+01		ug/kg	5.3E+01	95% UCL-T	W - Test (1)	5.3E+01	95% UCL-T	W - Test (1)
PCB-118	ug/kg	7.1E+02	3.3E+03	7.2E+03	DJ	ug/kg	3.3E+03	95% UCL-T	W - Test (1)	3.3E+03	95% UCL-T	W - Test (1)
PCB-123	ug/kg	8.2E+01	1.8E+02	7.4E+02	D	ug/kg	1.8E+02	95% UCL-T	W - Test (1)	1.8E+02	95% UCL-T	W - Test (1)
PCB-105	ug/kg	4.1E+02	2.2E+03	4.4E+03	D	ug/kg	2.2E+03	95% UCL-T	W - Test (1)	2.2E+03	95% UCL-T	W - Test (1)
PCB-114	ug/kg	4.2E+01	1.4E+02	4.4E+02	D	ug/kg	1.4E+02	95% UCL-T	W - Test (1)	1.4E+02	95% UCL-T	W - Test (1)
PCB-126	ug/kg	3.8E+00	7.6E+00	2.8E+01		ug/kg	7.6E+00	95% UCL-T	W - Test (1)	7.6E+00	95% UCL-T	W - Test (1)
PCB-128/167	ug/kg	5.2E+01	8.7E+01	4.2E+02	D	ug/kg	8.7E+01	95% UCL-T	W - Test (1)	8.7E+01	95% UCL-T	W - Test (1)

TABLE 3.12
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Medium: Soil
Medium Description: Parcel 1 and Parcel 2 soil, 0 to 10 feet
Exposure Medium: Particulates
Exposure Point: Fugitive Dust

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
PCB-156	ug/kg	2.5E+01	5.0E+01	2.2E+02	D	ug/kg	5.0E+01	95% UCL-T	W - Test (1)	5.0E+01	95% UCL-T	W - Test (1)
PCB-157	ug/kg	5.9E+00	1.1E+01	5.4E+01		ug/kg	1.1E+01	95% UCL-T	W - Test (1)	1.1E+01	95% UCL-T	W - Test (1)
PCB-189	ug/kg	1.7E+00	3.0E+00	8.3E+00		ug/kg	3.0E+00	95% UCL-T	W - Test (1)	3.0E+00	95% UCL-T	W - Test (1)
2,3,7,8-TCDD	ug/kg	3.0E-04	(3)	3.9E-04	J	ug/kg	3.9E-04	Max	(3)	3.0E-04	Mean	(3)
1,2,3,7,8-PeCDD	ug/kg	1.8E-03	(3)	3.6E-03		ug/kg	3.6E-03	Max	(3)	1.8E-03	Mean	(3)
1,2,3,4,7,8-HxCDD	ug/kg	2.9E-03	(3)	5.1E-03		ug/kg	5.1E-03	Max	(3)	2.9E-03	Mean	(3)
1,2,3,6,7,8-HxCDD	ug/kg	7.7E-03	(3)	1.2E-02		ug/kg	1.2E-02	Max	(3)	7.7E-03	Mean	(3)
1,2,3,7,8,9-HxCDD	ug/kg	5.7E-03	(3)	1.0E-02		ug/kg	1.0E-02	Max	(3)	5.7E-03	Mean	(3)
1,2,3,4,6,7,8-HpCDD	ug/kg	1.3E-01	(3)	2.5E-01		ug/kg	2.5E-01	Max	(3)	1.3E-01	Mean	(3)
OCDD	ug/kg	1.0E+00	(3)	2.0E+00		ug/kg	2.0E+00	Max	(3)	1.0E+00	Mean	(3)
2,3,7,8-TDCF	ug/kg	2.0E-02	(3)	5.9E-02		ug/kg	5.9E-02	Max	(3)	2.0E-02	Mean	(3)
1,2,3,7,8,-PeCDF	ug/kg	7.7E-03	(3)	2.2E-02		ug/kg	2.2E-02	Max	(3)	7.7E-03	Mean	(3)
2,3,4,7,8,-PeCDF	ug/kg	5.5E-02	(3)	1.4E-01		ug/kg	1.4E-01	Max	(3)	5.5E-02	Mean	(3)
1,2,3,4,7,8-HxCDF	ug/kg	1.5E-02	(3)	3.2E-02		ug/kg	3.2E-02	Max	(3)	1.5E-02	Mean	(3)
1,2,3,6,7,8-HxCDF	ug/kg	8.8E-03	(3)	1.9E-02	J+	ug/kg	1.9E-02	Max	(3)	8.8E-03	Mean	(3)
2,3,4,6,7,8-HxCDF	ug/kg	1.0E-02	(3)	2.1E-02		ug/kg	2.1E-02	Max	(3)	1.0E-02	Mean	(3)
1,2,3,7,8,9-HxCDF	ug/kg	4.3E-03	(3)	1.1E-02		ug/kg	1.1E-02	Max	(3)	4.3E-03	Mean	(3)
1,2,3,4,6,7,8-HpCDF	ug/kg	3.4E-02	(3)	6.3E-02		ug/kg	6.3E-02	Max	(3)	3.4E-02	Mean	(3)
1,2,3,4,7,8,9-HpCDF	ug/kg	3.8E-03	(3)	7.8E-03		ug/kg	7.8E-03	Max	(3)	3.8E-03	Mean	(3)
OCDF	ug/kg	5.2E-02	(3)	1.0E-01		ug/kg	1.0E-01	Max	(3)	5.2E-02	Mean	(3)
PCBs (total)	ug/kg	3.5E+04	9.8E+04	6.8E+05		ug/kg	9.8E+04	95% UCL-T	W - Test (1)	9.8E+04	95% UCL-T	W - Test (1)
PCBs (minus dioxin-like congeners)	ug/kg	3.4E+04	8.0E+04	6.7E+05		ug/kg	8.0E+04	95% UCL-T	W - Test (1)	8.0E+04	95% UCL-T	W - Test (1)

For compounds that were not detected, 1/2 detection limit was used as a proxy concentration to calculate the CT EPC and the 95% UCL. Duplicate sample results were averaged.
Only detected concentrations were used to calculate the arithmetic mean.
The maximum dioxin TEQ calculated from the EPCs in this table may differ from the maximum dioxin TEQ in Table 2 because dioxin, furan and dioxin-like PCB congeners that were never detected are not included in this table.
Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Ln-transformed Data (95% UCL-T); Mean of Ln-transformed Data (Mean-T); Mean of Normal Data (Mean-N).
(1) Shapiro-Wilk W Test indicates that data are log-normally distributed ($\alpha = 0.01$). Only detected concentrations were included in the distribution test.
(2) Data are not log-normally or normally distributed. We use the maximum detected concentration for the RME and the arithmetic average concentration for the CT.
(3) There are less than ten detected concentrations; therefore, we did not test the distribution shape of the data. We use the maximum detected concentration for the RME and the arithmetic average concentration for the CT.
(4) The 95% UCL is greater than the maximum detected concentration, therefore, we use the maximum detected concentration for the RME and the arithmetic average concentration for the CT.

References:

USEPA. 1994. Risk Updates, no. 2. United States Environmental Protection Agency, Region One, Waste Management Division. August 1994.
USEPA. 1992. Supplemental Guidance to RAGS: Calculating the Concentration Term. United States Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C. Intermittent Bulletin, vol. 1, no. 1. May 1992.

TABLE 3.13
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Medium: Soil
Medium Description: Parcel 1 and Parcel 2 soil, 0 to 10 feet
Exposure Medium: Vapors
Exposure Point: Vapors from stained soils

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
cis-1,2-Dichloroethene	ug/kg	1.9E+03	(2)	1.1E+04		ug/kg	1.1E+04	Max	(2)	1.8E+02	Mean	(2)
Tetrachloroethene	ug/kg	3.5E+02	1.3E+02	2.3E+03		ug/kg	1.3E+02	95% UCL-T	W - Test (1)	1.3E+02	95% UCL-T	W - Test (1)
n-Propylbenzene	ug/kg	2.6E+03	2.1E+02	2.5E+04		ug/kg	2.1E+02	95% UCL-T	W - Test (1)	2.1E+02	95% UCL-T	W - Test (1)
1,3,5-Trimethylbenzene	ug/kg	8.8E+03	7.4E+02	8.4E+04		ug/kg	7.4E+02	95% UCL-T	W - Test (1)	7.4E+02	95% UCL-T	W - Test (1)
1,2,4-Trimethylbenzene	ug/kg	1.7E+04	2.8E+03	1.9E+05		ug/kg	2.8E+03	95% UCL-T	W - Test (1)	2.8E+03	95% UCL-T	W - Test (1)
sec-Butylbenzene	ug/kg	9.4E+02	1.8E+02	6.0E+03		ug/kg	1.8E+02	95% UCL-T	W - Test (1)	1.8E+02	95% UCL-T	W - Test (1)
p-Isopropyltoluene	ug/kg	5.3E+02	1.9E+02	3.5E+03		ug/kg	1.9E+02	95% UCL-T	W - Test (1)	1.9E+02	95% UCL-T	W - Test (1)
Naphthalene	ug/kg	9.5E+02	8.0E+02	2.2E+04		ug/kg	8.0E+02	95% UCL-T	W - Test (1)	8.0E+02	95% UCL-T	W - Test (1)
bis(2-Ethylhexyl)phthalate	ug/kg	1.4E+04	3.4E+04	1.3E+05		ug/kg	3.4E+04	95% UCL-T	W - Test (1)	3.4E+04	95% UCL-T	W - Test (1)
C9-C18 Aliphatics	ug/kg	3.8E+05	1.1E+06	4.6E+06		ug/kg	1.1E+06	95% UCL-T	W - Test (1)	1.1E+06	95% UCL-T	W - Test (1)
C11-C22 Aromatics	ug/kg	4.6E+05	6.6E+05	8.2E+06		ug/kg	6.6E+05	95% UCL-T	W - Test (1)	6.6E+05	95% UCL-T	W - Test (1)

For compounds that were not detected, 1/2 detection limit was used as a proxy concentration to calculate the CT EPC and the 95% UCL. Duplicate sample results were averaged.
Only detected concentrations were used to calculate the arithmetic mean.
The maximum dioxin TEQ calculated from the EPCs in this table may differ from the maximum dioxin TEQ in Table 2 because dioxin, furan and dioxin-like PCB congeners that were never detected are not included in this table.
Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Ln-transformed Data (95% UCL-T); Mean of Ln-transformed Data (Mean-T); Mean of Normal Data (Mean-N).
(1) Shapiro-Wilk W Test indicates that data are log-normally distributed ($\alpha = 0.01$). Only detected concentrations were included in the distribution test.
(2) There are less than ten detected concentrations; therefore, we did not test the distribution shape of the data. We use the maximum detected concentration for the RME and the arithmetic average concentration for the CT.

References:

USEPA. 1994. Risk Updates, no. 2. United States Environmental Protection Agency, Region One, Waste Management Division. August 1994.
USEPA. 1992. Supplemental Guidance to RAGS: Calculating the Concentration Term. United States Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C. Intermittent Bulletin, vol. 1, no. 1. May 1992.

TABLE 3.14
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Medium: Soil
Medium Description: Parcel 1 and Parcel 2 soil, 0 to 1 foot
Exposure Medium: Surface Soil
Exposure Point: 0 to 1 foot soil

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Antimony	ug/kg	6.5E+02	6.2E+02	6.2E+03	J	ug/kg	6.2E+02	95% UCL-T	W - Test (2)	6.2E+02	95% UCL-T	W - Test (2)
Arsenic	ug/kg	6.3E+03	7.0E+03	2.2E+04	J	ug/kg	7.0E+03	95% UCL-T	W - Test (2)	7.0E+03	95% UCL-T	W - Test (2)
Barium	ug/kg	1.4E+05	(3)	3.2E+06		ug/kg	3.2E+06	Max	(3)	1.4E+05	Mean	(3)
Beryllium	ug/kg	3.4E+02	3.6E+02	4.9E+02	J	ug/kg	3.6E+02	95% UCL-T	W - Test (2)	3.6E+02	95% UCL-T	W - Test (2)
Cadmium	ug/kg	1.2E+03	(3)	2.3E+04		ug/kg	2.3E+04	Max	(3)	1.1E+03	Mean	(3)
Chromium	ug/kg	3.1E+04	(3)	5.3E+05		ug/kg	5.3E+05	Max	(3)	3.1E+04	Mean	(3)
Copper	ug/kg	1.2E+04	2.1E+04	4.1E+04		ug/kg	2.1E+04	95% UCL-T	W - Test (2)	2.1E+04	95% UCL-T	W - Test (2)
Lead	ug/kg	7.9E+05	9.0E+05	2.0E+07	J	ug/kg	9.0E+05	95% UCL-T	W - Test (2)	9.0E+05	95% UCL-T	W - Test (2)
Manganese	ug/kg	1.1E+05	(3)	2.6E+05	J	ug/kg	2.6E+05	Max	(3)	1.1E+05	Mean	(3)
Mercury	ug/kg	2.1E+02	3.0E+02	2.0E+03		ug/kg	3.0E+02	95% UCL-T	W - Test (2)	3.0E+02	95% UCL-T	W - Test (2)
Nickel	ug/kg	3.8E+04	(3)	9.2E+05		ug/kg	9.2E+05	Max	(3)	3.8E+04	Mean	(3)
Vanadium	ug/kg	1.4E+04	1.6E+04	1.8E+04		ug/kg	1.6E+04	95% UCL-T	W - Test (2)	1.6E+04	95% UCL-T	W - Test (2)
Zinc	ug/kg	1.0E+05	(3)	1.6E+06		ug/kg	1.6E+06	Max	(3)	1.0E+05	Mean	(3)
Molybdenum	ug/kg	3.4E+03	3.6E+03	2.1E+04		ug/kg	3.6E+03	95% UCL-T	W - Test (2)	3.6E+03	95% UCL-T	W - Test (2)
cis-1,2-Dichloroethene	ug/kg	2.5E+00	(1)	4.0E+00	J	ug/kg	4.0E+00	Max	(1)	4.0E+00	Max	(5)
Tetrachloroethene	ug/kg	7.2E+02	(1)	2.3E+03		ug/kg	2.3E+03	Max	(1)	1.6E+02	Mean	(1)
1,3,5-Trimethylbenzene	ug/kg	2.7E+03	(1)	5.3E+03		ug/kg	5.3E+03	Max	(1)	2.4E+02	Mean	(1)
1,2,4-Trimethylbenzene	ug/kg	4.8E+03	(1)	4.8E+03		ug/kg	4.8E+03	Max	(1)	2.2E+02	Mean	(1)
p-Isopropyltoluene	ug/kg	8.4E+00	(1)	8.4E+00	J	ug/kg	8.4E+00	Max	(1)	8.4E+00	Max	(5)
Naphthalene	ug/kg	2.5E+02	(1)	5.9E+02		ug/kg	5.9E+02	Max	(1)	7.1E+01	Mean	(1)
Benz(a)anthracene	ug/kg	7.9E+02	3.7E+03	4.2E+03	J	ug/kg	4.2E+03	Max	(4)	7.7E+02	Mean	(4)
Chrysene	ug/kg	8.6E+02	2.1E+03	7.2E+03	J	ug/kg	2.1E+03	95% UCL-T	W - Test (2)	2.1E+03	95% UCL-T	W - Test (2)
Benzo(b)fluoranthene	ug/kg	3.8E+02	1.2E+03	1.6E+03	J	ug/kg	1.2E+03	95% UCL-T	W - Test (2)	1.2E+03	95% UCL-T	W - Test (2)
Benzo(k)fluoranthene	ug/kg	3.4E+02	(3)	1.7E+03	J	ug/kg	1.7E+03	Max	(3)	4.3E+02	Mean	(3)
Benzo(a)pyrene	ug/kg	3.9E+02	(3)	2.0E+03	J	ug/kg	2.0E+03	Max	(3)	4.7E+02	Mean	(3)
Indeno(1,2,3-cd)pyrene	ug/kg	2.0E+02	6.6E+02	1.2E+03	J	ug/kg	6.6E+02	95% UCL-T	W - Test (2)	6.6E+02	95% UCL-T	W - Test (2)
Dibenz(a,h,)anthracene	ug/kg	9.0E+01	(1)	2.8E+02	J	ug/kg	2.8E+02	Max	(1)	2.8E+02	Max	(5)
bis(2-Ethylhexyl)phthalate	ug/kg	2.8E+04	3.6E+05	1.3E+05	EB	ug/kg	1.3E+05	Max	(4)	2.3E+04	Mean	(4)
C9-C18 Aliphatics	ug/kg	6.6E+05	9.7E+06	4.6E+06		ug/kg	4.6E+06	Max	(4)	4.8E+05	Mean	(4)
C11-C22 Aromatics	ug/kg	1.0E+06	8.3E+06	8.2E+06		ug/kg	8.2E+06	Max	(4)	8.8E+05	Mean	(4)
PCBs (total)	ug/kg	5.4E+04	3.8E+05	6.8E+05	DJ	ug/kg	3.8E+05	95% UCL-T	W - Test (2)	3.8E+05	95% UCL-T	W - Test (2)
PCBs (minus dioxin-like congeners)	ug/kg	5.3E+04	3.7E+05	6.7E+05	DJ	ug/kg	3.7E+05	95% UCL-T	W - Test (2)	3.7E+05	95% UCL-T	W - Test (2)
PCB-77	ug/kg	7.3E+02	(1)	3.0E+03	D	ug/kg	3.0E+03	Max	(1)	7.3E+02	Mean	(1)
PCB-81	ug/kg	3.3E+01	(1)	9.8E+01		ug/kg	9.8E+01	Max	(1)	3.3E+01	Mean	(1)
PCB-118	ug/kg	1.7E+03	(1)	7.2E+03	DJ	ug/kg	7.2E+03	Max	(1)	1.7E+03	Mean	(1)
PCB-123	ug/kg	1.8E+02	(1)	7.4E+02	D	ug/kg	7.4E+02	Max	(1)	1.8E+02	Mean	(1)
PCB-105	ug/kg	1.0E+03	(1)	4.4E+03	D	ug/kg	4.4E+03	Max	(1)	1.0E+03	Mean	(1)
PCB-114	ug/kg	1.0E+02	(1)	4.4E+02	D	ug/kg	4.4E+02	Max	(1)	1.0E+02	Mean	(1)
PCB-126	ug/kg	8.0E+00	(1)	2.8E+01		ug/kg	2.8E+01	Max	(1)	8.0E+00	Mean	(1)
PCB-128/167	ug/kg	1.1E+02	(1)	4.2E+02	D	ug/kg	4.2E+02	Max	(1)	1.1E+02	Mean	(1)
PCB-156	ug/kg	5.8E+01	(1)	2.2E+02	D	ug/kg	2.2E+02	Max	(1)	5.8E+01	Mean	(1)
PCB-157	ug/kg	1.3E+01	(1)	5.4E+01		ug/kg	5.4E+01	Max	(1)	1.3E+01	Mean	(1)
PCB-189	ug/kg	2.2E+00	(1)	8.3E+00		ug/kg	8.3E+00	Max	(1)	8.3E+00	Max	(5)

TABLE 3.14
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Medium: Soil
Medium Description: Parcel 1 and Parcel 2 soil, 0 to 1 foot
Exposure Medium: Surface Soil
Exposure Point: 0 to 1 foot soil

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
2,3,7,8-TCDD	ug/kg	3.0E-04	(1)	3.9E-04		ug/kg	3.9E-04	Max	(1)	3.0E-04	Mean	(1)
1,2,3,7,8-PeCDD	ug/kg	1.8E-03	(1)	3.6E-03		ug/kg	3.6E-03	Max	(1)	1.8E-03	Mean	(1)
1,2,3,4,7,8-HxCDD	ug/kg	2.9E-03	(1)	5.1E-03		ug/kg	5.1E-03	Max	(1)	2.9E-03	Mean	(1)
1,2,3,6,7,8-HxCDD	ug/kg	7.7E-03	(1)	1.2E-02		ug/kg	1.2E-02	Max	(1)	7.7E-03	Mean	(1)
1,2,3,7,8,9-HxCDD	ug/kg	5.7E-03	(1)	1.0E-02		ug/kg	1.0E-02	Max	(1)	5.7E-03	Mean	(1)
1,2,3,4,6,7,8-HpCDD	ug/kg	1.3E-01	(1)	2.5E-01		ug/kg	2.5E-01	Max	(1)	1.3E-01	Mean	(1)
OCDD	ug/kg	1.0E+00	(1)	2.0E+00		ug/kg	2.0E+00	Max	(1)	1.0E+00	Mean	(1)
2,3,7,8-TDCF	ug/kg	2.0E-02	(1)	5.9E-02		ug/kg	5.9E-02	Max	(1)	2.0E-02	Mean	(1)
1,2,3,7,8,-PeCDF	ug/kg	7.7E-03	(1)	2.2E-02		ug/kg	2.2E-02	Max	(1)	7.7E-03	Mean	(1)
2,3,4,7,8,-PeCDF	ug/kg	5.5E-02	(1)	1.4E-01		ug/kg	1.4E-01	Max	(1)	5.5E-02	Mean	(1)
1,2,3,4,7,8-HxCDF	ug/kg	1.5E-02	(1)	3.2E-02		ug/kg	3.2E-02	Max	(1)	1.5E-02	Mean	(1)
1,2,3,6,7,8-HxCDF	ug/kg	8.8E-03	(1)	1.9E-02	J+	ug/kg	1.9E-02	Max	(1)	8.8E-03	Mean	(1)
2,3,4,6,7,8-HxCDF	ug/kg	1.0E-02	(1)	2.1E-02		ug/kg	2.1E-02	Max	(1)	1.0E-02	Mean	(1)
1,2,3,7,8,9-HxCDF	ug/kg	4.3E-03	(1)	1.1E-02		ug/kg	1.1E-02	Max	(1)	4.3E-03	Mean	(1)
1,2,3,4,6,7,8-HpCDF	ug/kg	3.4E-02	(1)	6.3E-02		ug/kg	6.3E-02	Max	(1)	3.4E-02	Mean	(1)
1,2,3,4,7,8,9-HpCDF	ug/kg	3.8E-03	(1)	7.8E-03		ug/kg	7.8E-03	Max	(1)	3.8E-03	Mean	(1)
OCDF	ug/kg	5.2E-02	(1)	1.0E-01		ug/kg	1.0E-01	Max	(1)	5.2E-02	Mean	(1)

For compounds that were not detected, 1/2 detection limit was used as a proxy concentration to calculate the CT EPC and the 95% UCL. Duplicate sample results were averaged.
Only detected concentrations were used to calculate the arithmetic mean.
The maximum dioxin TEQ calculated from the EPCs in this table may differ from the maximum dioxin TEQ in Table 2 because dioxin, furan and dioxin-like PCB congeners that were never detected are not included in this table.
Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Ln-transformed Data (95% UCL-T); Mean of Ln-transformed Data (Mean-T); Mean of Normal Data (Mean-N).
(1) There are less than ten detected concentrations; therefore, we did not test the distribution shape of the data. We use the maximum detected concentration for the RME and the arithmetic average concentration for the CT.
(2) Shapiro-Wilk W Test indicates that data are log-normally distributed ($\alpha = 0.01$). Only detected concentrations were included in the distribution test.
(3) Data are not log-normally or normally distributed. We use the maximum detected concentration for the RME and the arithmetic average concentration for the CT.
(4) The 95% UCL is greater than the maximum detected concentration, therefore, we use the maximum detected concentration for the RME and the arithmetic average concentration for the CT.
(5) The mean (calculated using half the detection limit for non-detect) is greater than the maximum detected concentration, due to exeptionally high detection limits in a few samples. Therefore, we use the maximum detected concentration for the CT EPC.

References:

USEPA. 1994. Risk Updates, no. 2. United States Environmental Protection Agency, Region One, Waste Management Division. August 1994.
USEPA. 1992. Supplemental Guidance to RAGS: Calculating the Concentration Term. United States Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C. Intermittent Bulletin, vol. 1, no. 1. May 1992.

TABLE 3.15
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Medium: Soil
Medium Description: Parcel 1 and Parcel 2 soil, 0 to 1 foot
Exposure Medium: Particulates
Exposure Point: Fugitive dust

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Antimony	ug/kg	6.5E+02	6.2E+02	6.2E+03	J	ug/kg	6.2E+02	95% UCL-T	W - Test (2)	6.2E+02	95% UCL-T	W - Test (2)
Arsenic	ug/kg	6.3E+03	7.0E+03	2.2E+04	J	ug/kg	7.0E+03	95% UCL-T	W - Test (2)	7.0E+03	95% UCL-T	W - Test (2)
Barium	ug/kg	1.4E+05	(3)	3.2E+06		ug/kg	3.2E+06	Max	(3)	1.4E+05	Mean	(3)
Beryllium	ug/kg	3.4E+02	3.6E+02	4.9E+02	J	ug/kg	3.6E+02	95% UCL-T	W - Test (2)	3.6E+02	95% UCL-T	W - Test (2)
Cadmium	ug/kg	1.2E+03	(3)	2.3E+04		ug/kg	2.3E+04	Max	(3)	1.1E+03	Mean	(3)
Chromium	ug/kg	3.1E+04	(3)	5.3E+05		ug/kg	5.3E+05	Max	(3)	3.1E+04	Mean	(3)
Copper	ug/kg	1.2E+04	2.1E+04	4.1E+04		ug/kg	2.1E+04	95% UCL-T	W - Test (2)	2.1E+04	95% UCL-T	W - Test (2)
Lead	ug/kg	7.9E+05	9.0E+05	2.0E+07	J	ug/kg	9.0E+05	95% UCL-T	W - Test (2)	9.0E+05	95% UCL-T	W - Test (2)
Manganese	ug/kg	1.1E+05	(3)	2.6E+05	J	ug/kg	2.6E+05	Max	(3)	1.1E+05	Mean	(3)
Mercury	ug/kg	2.1E+02	3.0E+02	2.0E+03		ug/kg	3.0E+02	95% UCL-T	W - Test (2)	3.0E+02	95% UCL-T	W - Test (2)
Nickel	ug/kg	3.8E+04	(3)	9.2E+05		ug/kg	9.2E+05	Max	(3)	3.8E+04	Mean	(3)
Vanadium	ug/kg	1.4E+04	1.6E+04	1.8E+04		ug/kg	1.6E+04	95% UCL-T	W - Test (2)	1.6E+04	95% UCL-T	W - Test (2)
Zinc	ug/kg	1.0E+05	(3)	1.6E+06		ug/kg	1.6E+06	Max	(3)	1.0E+05	Mean	(3)
Molybdenum	ug/kg	3.4E+03	3.6E+03	2.1E+04		ug/kg	3.6E+03	95% UCL-T	W - Test (2)	3.6E+03	95% UCL-T	W - Test (2)
cis-1,2-Dichloroethene	ug/kg	2.5E+00	(1)	4.0E+00	J	ug/kg	4.0E+00	Max	(1)	4.0E+00	Max	(5)
Tetrachloroethene	ug/kg	7.2E+02	(1)	2.3E+03		ug/kg	2.3E+03	Max	(1)	1.6E+02	Mean	(1)
1,3,5-Trimethylbenzene	ug/kg	2.7E+03	(1)	5.3E+03		ug/kg	5.3E+03	Max	(1)	2.4E+02	Mean	(1)
1,2,4-Trimethylbenzene	ug/kg	4.8E+03	(1)	4.8E+03		ug/kg	4.8E+03	Max	(1)	2.2E+02	Mean	(1)
p-Isopropyltoluene	ug/kg	8.4E+00	(1)	8.4E+00	J	ug/kg	8.4E+00	Max	(1)	8.5E+01	Max	(5)
Naphthalene	ug/kg	2.5E+02	(1)	5.9E+02		ug/kg	5.9E+02	Max	(1)	7.1E+01	Mean	(1)
Benz(a)anthracene	ug/kg	7.9E+02	3.7E+03	4.2E+03	J	ug/kg	4.2E+03	Max	(4)	7.7E+02	Mean	(4)
Chrysene	ug/kg	8.6E+02	2.1E+03	7.2E+03	J	ug/kg	2.1E+03	95% UCL-T	W - Test (2)	2.1E+03	95% UCL-T	W - Test (2)
Benzo(b)fluoranthene	ug/kg	3.8E+02	1.2E+03	1.6E+03	J	ug/kg	1.2E+03	95% UCL-T	W - Test (2)	1.2E+03	95% UCL-T	W - Test (2)
Benzo(k)fluoranthene	ug/kg	3.4E+02	(3)	1.7E+03	J	ug/kg	1.7E+03	Max	(3)	4.3E+02	Mean	(3)
Benzo(a)pyrene	ug/kg	3.9E+02	(3)	2.0E+03	J	ug/kg	2.0E+03	Max	(3)	4.7E+02	Mean	(3)
Indeno(1,2,3-cd)pyrene	ug/kg	2.0E+02	6.6E+02	1.2E+03	J	ug/kg	6.6E+02	95% UCL-T	W - Test (2)	6.6E+02	95% UCL-T	W - Test (2)
Dibenz(a,h,)anthracene	ug/kg	9.0E+01	(1)	2.8E+02	J	ug/kg	2.8E+02	Max	(1)	4.4E+02	Max	(5)
bis(2-Ethylhexyl)phthalate	ug/kg	2.8E+04	3.6E+05	1.3E+05	EB	ug/kg	1.3E+05	Max	(4)	2.3E+04	Mean	(4)
C9-C18 Aliphatics	ug/kg	6.6E+05	9.7E+06	4.6E+06		ug/kg	4.6E+06	Max	(4)	4.8E+05	Mean	(4)
C11-C22 Aromatics	ug/kg	1.0E+06	8.3E+06	8.2E+06		ug/kg	8.2E+06	Max	(4)	8.8E+05	Mean	(4)
PCBs (total)	ug/kg	5.4E+04	3.8E+05	6.8E+05	DJ	ug/kg	3.8E+05	95% UCL-T	W - Test (2)	3.8E+05	95% UCL-T	W - Test (2)
PCBs (minus dioxin-like congeners)	ug/kg	5.3E+04	3.7E+05	6.7E+05	DJ	ug/kg	3.7E+05	95% UCL-T	W - Test (2)	3.7E+05	95% UCL-T	W - Test (2)
PCB-77	ug/kg	7.3E+02	(1)	3.0E+03	D	ug/kg	3.0E+03	Max	(1)	7.3E+02	Mean	(1)
PCB-81	ug/kg	3.3E+01	(1)	9.8E+01		ug/kg	9.8E+01	Max	(1)	3.3E+01	Mean	(1)
PCB-118	ug/kg	1.7E+03	(1)	7.2E+03	DJ	ug/kg	7.2E+03	Max	(1)	1.7E+03	Mean	(1)
PCB-123	ug/kg	1.8E+02	(1)	7.4E+02	D	ug/kg	7.4E+02	Max	(1)	1.8E+02	Mean	(1)
PCB-105	ug/kg	1.0E+03	(1)	4.4E+03	D	ug/kg	4.4E+03	Max	(1)	1.0E+03	Mean	(1)
PCB-114	ug/kg	1.0E+02	(1)	4.4E+02	D	ug/kg	4.4E+02	Max	(1)	1.0E+02	Mean	(1)
PCB-126	ug/kg	8.0E+00	(1)	2.8E+01		ug/kg	2.8E+01	Max	(1)	8.0E+00	Mean	(1)
PCB-128/167	ug/kg	1.1E+02	(1)	4.2E+02	D	ug/kg	4.2E+02	Max	(1)	1.1E+02	Mean	(1)
PCB-156	ug/kg	5.8E+01	(1)	2.2E+02	D	ug/kg	2.2E+02	Max	(1)	5.8E+01	Mean	(1)
PCB-157	ug/kg	1.3E+01	(1)	5.4E+01		ug/kg	5.4E+01	Max	(1)	1.3E+01	Mean	(1)
PCB-189	ug/kg	2.2E+00	(1)	8.3E+00		ug/kg	8.3E+00	Max	(1)	9.9E+00	Max	(5)

TABLE 3.15
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Medium: Soil
Medium Description: Parcel 1 and Parcel 2 soil, 0 to 1 foot
Exposure Medium: Particulates
Exposure Point: Fugitive dust

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
2,3,7,8-TCDD	ug/kg	3.0E-04	(1)	3.9E-04		ug/kg	3.9E-04	Max	(1)	3.0E-04	Mean	(1)
1,2,3,7,8-PeCDD	ug/kg	1.8E-03	(1)	3.6E-03		ug/kg	3.6E-03	Max	(1)	1.8E-03	Mean	(1)
1,2,3,4,7,8-HxCDD	ug/kg	2.9E-03	(1)	5.1E-03		ug/kg	5.1E-03	Max	(1)	2.9E-03	Mean	(1)
1,2,3,6,7,8-HxCDD	ug/kg	7.7E-03	(1)	1.2E-02		ug/kg	1.2E-02	Max	(1)	7.7E-03	Mean	(1)
1,2,3,7,8,9-HxCDD	ug/kg	5.7E-03	(1)	1.0E-02		ug/kg	1.0E-02	Max	(1)	5.7E-03	Mean	(1)
1,2,3,4,6,7,8-HpCDD	ug/kg	1.3E-01	(1)	2.5E-01		ug/kg	2.5E-01	Max	(1)	1.3E-01	Mean	(1)
OCDD	ug/kg	1.0E+00	(1)	2.0E+00		ug/kg	2.0E+00	Max	(1)	1.0E+00	Mean	(1)
2,3,7,8-TDCF	ug/kg	2.0E-02	(1)	5.9E-02		ug/kg	5.9E-02	Max	(1)	2.0E-02	Mean	(1)
1,2,3,7,8,-PeCDF	ug/kg	7.7E-03	(1)	2.2E-02		ug/kg	2.2E-02	Max	(1)	7.7E-03	Mean	(1)
2,3,4,7,8,-PeCDF	ug/kg	5.5E-02	(1)	1.4E-01		ug/kg	1.4E-01	Max	(1)	5.5E-02	Mean	(1)
1,2,3,4,7,8-HxCDF	ug/kg	1.5E-02	(1)	3.2E-02		ug/kg	3.2E-02	Max	(1)	1.5E-02	Mean	(1)
1,2,3,6,7,8-HxCDF	ug/kg	8.8E-03	(1)	1.9E-02	J+	ug/kg	1.9E-02	Max	(1)	8.8E-03	Mean	(1)
2,3,4,6,7,8-HxCDF	ug/kg	1.0E-02	(1)	2.1E-02		ug/kg	2.1E-02	Max	(1)	1.0E-02	Mean	(1)
1,2,3,7,8,9-HxCDF	ug/kg	4.3E-03	(1)	1.1E-02		ug/kg	1.1E-02	Max	(1)	4.3E-03	Mean	(1)
1,2,3,4,6,7,8-HpCDF	ug/kg	3.4E-02	(1)	6.3E-02		ug/kg	6.3E-02	Max	(1)	3.4E-02	Mean	(1)
1,2,3,4,7,8,9-HpCDF	ug/kg	3.8E-03	(1)	7.8E-03		ug/kg	7.8E-03	Max	(1)	3.8E-03	Mean	(1)
OCDF	ug/kg	5.2E-02	(1)	1.0E-01		ug/kg	1.0E-01	Max	(1)	5.2E-02	Mean	(1)

For compounds that were not detected, 1/2 detection limit was used as a proxy concentration to calculate the CT EPC and the 95% UCL. Duplicate sample results were averaged.
Only detected concentrations were used to calculate the arithmetic mean.
The maximum dioxin TEQ calculated from the EPCs in this table may differ from the maximum dioxin TEQ in Table 2 because dioxin, furan and dioxin-like PCB congeners that were never detected are not included in this table.
Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Ln-transformed Data (95% UCL-T); Mean of Ln-transformed Data (Mean-T); Mean of Normal Data (Mean-N).
(1) There are less than ten detected concentrations; therefore, we did not test the distribution shape of the data. We use the maximum detected concentration for the RME and the arithmetic average concentration for the CT.
(2) Shapiro-Wilk W Test indicates that data are log-normally distributed ($\alpha = 0.01$). Only detected concentrations were included in the distribution test.
(3) Data are not log-normally or normally distributed. We use the maximum detected concentration for the RME and the arithmetic average concentration for the CT.
(4) The 95% UCL is greater than the maximum detected concentration, therefore, we use the maximum detected concentration for the RME and the arithmetic average concentration for the CT.
(5) The mean (calculated using half the detection limit for non-detect) is greater than the maximum detected concentration, due to exeptionally high detection limits in a few samples. Therefore, we use the maximum detected concentration for the CT EPC.

References:

USEPA. 1994. Risk Updates, no. 2. United States Environmental Protection Agency, Region One, Waste Management Division. August 1994.
USEPA. 1992. Supplemental Guidance to RAGS: Calculating the Concentration Term. United States Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C. Intermittent Bulletin, vol. 1, no. 1. May 1992.

TABLE 3.16
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Medium: Soil
Medium Description: Parcel 1 and Parcel 2 soil, 0 to 1 foot
Exposure Medium: Vapors
Exposure Point: Vapors from surface soils

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
cis-1,2-Dichloroethene	ug/kg	2.5E+00	(1)	4.0E+00	J	ug/kg	4.0E+00	Max	(1)	4.0E+00	Max	(3)
Tetrachloroethene	ug/kg	7.2E+02	(1)	2.3E+03		ug/kg	2.3E+03	Max	(1)	1.6E+02	Mean	(1)
1,3,5-Trimethylbenzene	ug/kg	2.7E+03	(1)	5.3E+03		ug/kg	5.3E+03	Max	(1)	2.4E+02	Mean	(1)
1,2,4-Trimethylbenzene	ug/kg	4.8E+03	(1)	4.8E+03		ug/kg	4.8E+03	Max	(1)	2.2E+02	Mean	(1)
p-Isopropyltoluene	ug/kg	8.4E+00	(1)	8.4E+00	J	ug/kg	8.4E+00	Max	(1)	8.4E+00	Max	(3)
Naphthalene	ug/kg	2.5E+02	(1)	5.9E+02		ug/kg	5.9E+02	Max	(1)	7.1E+01	Mean	(1)
bis(2-Ethylhexyl)phthalate	ug/kg	2.8E+04	3.6E+05	1.3E+05	EB	ug/kg	1.3E+05	Max	(2)	2.3E+04	Mean	(2)
C9-C18 Aliphatics	ug/kg	6.2E+05	9.7E+06	4.6E+06		ug/kg	4.6E+06	Max	(2)	4.8E+05	Mean	(2)
C11-C22 Aromatics	ug/kg	1.0E+06	8.3E+06	8.2E+06		ug/kg	8.2E+06	Max	(2)	8.8E+05	Mean	(2)

For compounds that were not detected, 1/2 detection limit was used as a proxy concentration to calculate the CT EPC and the 95% UCL. Duplicate sample results were averaged.
Only detected concentrations were used to calculate the arithmetic mean.
The maximum dioxin TEQ calculated from the EPCs in this table may differ from the maximum dioxin TEQ in Table 2 because dioxin, furan and dioxin-like PCB congeners that were never detected are not included in this table.
Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Ln-transformed Data (95% UCL-T); Mean of Ln-transformed Data (Mean-T); Mean of Normal Data (Mean-N).
(1) There are less than ten detected concentrations; therefore, we did not test the distribution shape of the data. We use the maximum detected concentration for the RME and the arithmetic average concentration for the CT.
(2) The 95% UCL is greater than the maximum detected concentration, therefore, we use the maximum detected concentration for the RME and the arithmetic average concentration for the CT.
(3) The mean (calculated using half the detection limit for non-detect) is greater than the maximum detected concentration, due to exeptionally high detection limits in a few samples. Therefore, we use the maximum detected concentration for the CT EPC.

References:

USEPA. 1994. Risk Updates, no. 2. United States Environmental Protection Agency, Region One, Waste Management Division. August 1994.
USEPA. 1992. Supplemental Guidance to RAGS: Calculating the Concentration Term. United States Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C. Intermittent Bulletin, vol. 1, no. 1. May 1992.

APPENDIX I

MODELED EXPOSURE PATHWAYS

Modeled Exposure Pathways

This appendix provides model assumptions and estimated hazard indices and cancer risks for exposure pathways where the exposure point concentration was modeled rather than measured. These pathways include:

- Inhalation of fugitive dust from soil
- Inhalation of vapors from soil

These exposure pathways were modeled for the following receptors:

- Resident
- Construction worker
- Trespasser

TABLE I-1
MODELING PARAMETERS - PARTICULATE EMISSION FACTOR (PEF) FOR FUGITIVE DUST
Beede Waste Oil/Cash Energy Site

Variable	Value	Units	Source
Q/C (Dispersion)	71.87	g/m^2-s per kg/m^3	USEPA 1996 (Table 3); Harrisburg - 1 Acre
V (fraction of Vegetative Cover)	0	unitless	USEPA 1991
Um (mean annual windspeed)	4.69	m/s	EQ 1994
Ut (equivalent threshold value of windspeed)	11.32	m/s	USEPA 1991
F(x) (function dependent on U_m/U_t)	0.194	unitless	USEPA 1996 (Table 3); Harrisburg - 1 Acre

PEF (m^3/kg) = 5.21E+08

References:

USEPA, 1991. Risk Assessment Guidance for Superfund Volume 1: Human Health Evaluation Manual.
(Part B, Development of Risk-based Preliminary Remediation Goals). Interim. Publication 9285.7-01B.
Office of Emergency and Remedial Response, Washington, D.C.

EQ (Environmental Quality Management), 1994. Revisions to VF and PEF Equations. Memorandum #5099-3.
Prepared for Office of Emergency and Remedial Response. United States Environmental Protection Agency, Washington, D.C.

USEPA, 1996. Soil Screening Guidance: Technical Background Document. 2nd edition. EPA/540/R95/128.
Office of Solid Waste and Emergency and Remedial Response, Washington, D.C.

TABLE I-2
MODELING PARAMETERS - VOLATILIZATION FACTOR
Beede Waste Oil/Cash Energy Site

				$(n-\theta_w)$	(Table 37, USEPA 1996)	(Table 36, USEPA 1996)	(EQ 1994)	(Table 37, USEPA 1996)	$(1-\rho_b/\rho_s)$	(USEPA 1991)		(Table 3, USEPA 1996)	(Table 39, USEPA 1996)	(USEPA 1996)	(USEPA 1991)
				(L_{air}/L_{soil})	(cm^2/s)	(Dimensionless)	(L_{water}/L_{soil})	(cm^2/s)	(L_{pore}/L_{soil})	(g/cm3)	$(K_{oc} \times f_{oc})$	(g/m2-s per kg/m3)	(cm^3/g)	(g/g)	(sec)
CAS #	**Compound**	**VF**	**D_a**	**q_a**	**D_i**	**H'**	**q_w**	**D_w^e**	**n**	**r_b**	**K_d**	**Q/C**	**K_{oc} [geometric mean]**	**F_{oc}**	**T**
	Volatile Organic Compounds														
71-43-2	Benzene	2.91E+03	2.02E-03	0.28	8.80E-02	2.28E-01	0.15	9.80E-06	0.43	1.5	3.72E-01	71.87	6.20E+01	0.006	9.50E+08
	n-Butylbenzene	---	---	0.28			0.15		0.43	1.5		71.87		0.006	9.50E+08
	sec-Butylbenzene	---	---	0.28			0.15		0.43	1.5		71.87		0.006	9.50E+08
	tert-Butylbenzene	---	---	0.28			0.15		0.43	1.5		71.87		0.006	9.50E+08
75-00-3	Chloroethane	---	---	0.28			0.15		0.43	1.5		71.87		0.006	9.50E+08
74-87-3	Chloromethane	---	---	0.28			0.15		0.43	1.5		71.87		0.006	9.50E+08
	Dichlorodifluoromethane	---	---	0.28			0.15		0.43	1.5		71.87		0.006	9.50E+08
75-34-3	1,1-Dichloroethane	3.00E+03	1.91E-03	0.28	7.42E-02	2.30E-01	0.15	1.05E-05	0.43	1.5	3.20E-01	71.87	5.34E+01	0.006	9.50E+08
107-06-2	1,2-Dichloroethane	5.16E+03	6.44E-04	0.28	1.04E-01	4.01E-02	0.15	9.90E-06	0.43	1.5	2.28E-01	71.87	3.80E+01	0.006	9.50E+08
75-35-4	1,1-Dichloroethene	1.54E+03	7.23E-03	0.28	9.00E-02	1.07E+00	0.15	1.04E-05	0.43	1.5	3.90E-01	71.87	6.50E+01	0.006	9.50E+08
156-59-2	1,2-Dichloroethene (cis)	3.04E+03	1.85E-03	0.28	7.36E-02	1.67E-01	0.15	1.13E-05	0.43	1.5	2.13E-01	71.87	3.55E+01	0.006	9.50E+08
156-60-5	1,2-Dichloroethene (trans)	2.20E+03	3.52E-03	0.28	7.07E-02	3.85E-01	0.15	1.19E-05	0.43	1.5	2.28E-01	71.87	3.80E+01	0.006	9.50E+08
100-41-4	Ethylbenzene	4.35E+03	9.06E-04	0.28	7.50E-02	3.23E-01	0.15	7.80E-06	0.43	1.5	1.22E+00	71.87	2.04E+02	0.006	9.50E+08
	para-Isopropyltoluene	---	---	0.28			0.15		0.43	1.5		71.87		0.006	9.50E+08
75-09-2	Methylene Chloride	2.54E+03	2.66E-03	0.28	1.01E-01	8.98E-02	0.15	1.17E-05	0.43	1.5	6.00E-02	71.87	1.00E+01	0.006	9.50E+08
1634-04-4	Methyl-tert-butyl ether	---	---	0.28			0.15		0.43	1.5		71.87		0.006	9.50E+08
	n-Propylbenzene	---	---	0.28			0.15		0.43	1.5		71.87		0.006	9.50E+08
79-34-5	1,1,2,2-Tetrachloroethane	1.38E+04	9.00E-05	0.28	7.10E-02	1.41E-02	0.15	7.90E-06	0.43	1.5	4.74E-01	71.87	7.90E+01	0.006	9.50E+08
127-18-4	Tetrachloroethene	3.34E+03	1.54E-03	0.28	7.20E-02	7.54E-01	0.15	8.20E-06	0.43	1.5	1.59E+00	71.87	2.65E+02	0.006	9.50E+08
108-88-3	Toluene	3.72E+03	1.24E-03	0.28	8.70E-02	2.72E-01	0.15	8.60E-06	0.43	1.5	8.40E-01	71.87	1.40E+02	0.006	9.50E+08
71-55-6	1,1,1-Trichloroethane	2.50E+03	2.73E-03	0.28	7.80E-02	7.05E-01	0.15	8.80E-06	0.43	1.5	8.10E-01	71.87	1.35E+02	0.006	9.50E+08
79-01-6	Trichloroethene	2.72E+03	2.32E-03	0.28	7.90E-02	4.22E-01	0.15	9.10E-06	0.43	1.5	5.66E-01	71.87	9.43E+01	0.006	9.50E+08
	1,2,4-Trimethylbenzene	1.08E+04	1.46E-04	0.28	6.50E-02	2.49E-01	0.15	7.83E-06	0.43	1.5	5.59E+00	71.87	9.31E+02	0.006	9.50E+08
	1,3,5-Trimethylbenzene	---	---	0.28			0.15		0.43	1.5		71.87		0.006	9.50E+08
75-01-4	Vinyl Chloride	1.09E+03	1.45E-02	0.28	1.06E-01	1.10E+00	0.15	1.23E-06	0.43	1.5	1.12E-01	71.87	1.86E+01	0.006	9.50E+08
	Petroleum Hydrocarbon Fractions														
	Volatile Petroleum Hydrocarbons														
	C5-C8 Aliphatics	1.35E+03	9.41E-03	0.28	8.00E-02	5.40E+01	0.15	1.00E-05	0.43	1.5	1.36E+01	71.87	2.27E+03	0.006	9.50E+08
	C9-C12 Aliphatics	8.14E+03	2.58E-04	0.28	7.00E-02	6.50E+01	0.15	1.00E-05	0.43	1.5	9.00E+02	71.87	1.50E+05	0.006	9.50E+08
	C9-C10 Aromatics	1.24E+04	1.10E-04	0.28	7.00E-02	3.30E-01	0.15	1.00E-05	0.43	1.5	1.07E+01	71.87	1.78E+03	0.006	9.50E+08
	Extractable Petroleum Hydrocarbons														
	C9-C18 Aliphatics	1.67E+04	6.11E-05	0.28	7.00E-02	6.90E+01	0.15	1.00E-05	0.43	1.5	4.08E+03	71.87	6.80E+05	0.006	9.50E+08
	C19-C36 Aliphatic	---	---	0.28	NA	NA	0.15	1.00E-05	0.43	1.5	NA	71.87	NA	0.006	9.50E+08
	C11-C22 Aromatics	7.43E+04	3.10E-06	0.28	6.00E-02	3.00E-02	0.15	1.00E-05	0.43	1.5	3.00E+01	71.87	5.00E+03	0.006	9.50E+08
	Semivolatile Organic Compounds														
	Non-Carcinogenic PAHs														
208-96-8	Acenaphthylene	6.91E+04	3.58E-06	0.28	4.43E-02	2.36E-02	0.15	7.44E-06	0.43	1.5	1.50E+01	71.87	2.50E+03	0.006	9.50E+08
191-24-2	Benzo(ghi)perylene	6.99E+07	3.50E-12	0.28	2.03E-02	2.95E-10	0.15	5.20E-06	0.43	1.5	9.60E+03	71.87	1.60E+06	0.006	9.50E+08
91-57-6	2-Methylnaphthalene	4.69E+04	7.80E-06	0.28	4.84E-02	4.20E-02	0.15	7.75E-06	0.43	1.5	1.34E+01	71.87	2.23E+03	0.006	9.50E+08
91-20-3	Naphthalene	4.53E+04	8.35E-06	0.28	5.90E-02	1.98E-02	0.15	7.50E-06	0.43	1.5	7.15E+00	71.87	1.19E+03	0.006	9.50E+08

TABLE I-2
MODELING PARAMETERS - VOLATILIZATION FACTOR
Beede Waste Oil/Cash Energy Site

CAS #	Compound	VF	D_a	q_a	D_i	H'	q_w	D_w^e	n	r_b	K_d	Q/C	K_{oc} [geometric mean]	F_{oc}	T
85-01-8	Phenanthrene	5.80E+04	5.08E-06	0.28	3.33E-02	2.48E-01	0.15	7.47E-06	0.43	1.5	8.40E+01	71.87	1.40E+04	0.006	9.50E+08
	Carcinogenic PAHs														
56-55-3	Benz(a)anthracene	9.35E+06	1.96E-10	0.28	5.10E-02	1.37E-04	0.15	9.00E-06	0.43	1.5	2.15E+03	71.87	3.58E+05	0.006	9.50E+08
50-32-8	Benzo(a)pyrene	2.48E+07	2.77E-11	0.28	4.30E-02	4.63E-05	0.15	9.00E-06	0.43	1.5	5.81E+03	71.87	9.69E+05	0.006	9.50E+08
205-99-2	Benzo(b)fluoranthene	4.85E+06	7.26E-10	0.28	2.26E-02	4.55E-03	0.15	5.56E-06	0.43	1.5	7.38E+03	71.87	1.23E+06	0.006	9.50E+08
207-08-9	Benzo(k)fluoranthene	4.08E+07	1.03E-11	0.28	2.26E-02	3.40E-05	0.15	5.56E-06	0.43	1.5	7.38E+03	71.87	1.23E+06	0.006	9.50E+08
218-01-9	Chrysene	2.85E+06	2.10E-09	0.28	2.48E-02	3.88E-03	0.15	6.21E-06	0.43	1.5	2.39E+03	71.87	3.98E+05	0.006	9.50E+08
53-70-3	Dibenzo(ah)anthracene	7.34E+07	3.18E-12	0.28	2.02E-02	6.03E-07	0.15	5.18E-06	0.43	1.5	1.07E+04	71.87	1.79E+06	0.006	9.50E+08
193-39-5	Indeno(123-cd)pyrene	5.94E+07	4.86E-12	0.28	1.90E-02	6.56E-05	0.15	5.66E-06	0.43	1.5	2.08E+04	71.87	3.47E+06	0.006	9.50E+08
	Phthalates														
117-81-7	bis(2-Ethylhexyl)phthalate	1.91E+07	4.69E-11	0.28	3.51E-02	4.18E-06	0.15	3.66E-06	0.43	1.5	6.67E+02	71.87	1.11E+05	0.006	9.50E+08
	Other SVOCs														
95-50-1	1,2-Dichlorobenzene	1.21E+04	1.17E-04	0.28	6.90E-02	7.79E-02	0.15	7.90E-06	0.43	1.5	2.27E+00	71.87	3.79E+02	0.006	9.50E+08
	Pesticides														
309-00-2	Aldrin	1.02E+06	1.64E-08	0.28	1.32E-02	6.97E-03	0.15	4.86E-06	0.43	1.5	2.92E+02	71.87	4.87E+04	0.006	9.50E+08
319-84-6	alpha-BHC	7.05E+05	3.45E-08	0.28	1.42E-02	4.35E-04	0.15	7.34E-06	0.43	1.5	1.06E+01	71.87	1.76E+03	0.006	9.50E+08
58-89-9	gamma-BHC (Lindane)	5.47E+05	5.73E-08	0.28	1.42E-02	5.74E-04	0.15	7.34E-06	0.43	1.5	8.10E+00	71.87	1.35E+03	0.006	9.50E+08
72-55-9	4,4'-DDE	3.61E+06	1.31E-09	0.28	1.44E-02	8.61E-04	0.15	5.87E-06	0.43	1.5	5.18E+02	71.87	8.64E+04	0.006	9.50E+08
50-29-3	4,4'-DDT	1.61E+07	6.58E-11	0.28	1.37E-02	3.32E-04	0.15	4.95E-06	0.43	1.5	4.07E+03	71.87	6.78E+05	0.006	9.50E+08
60-57-1	Dieldrin	2.47E+06	2.82E-09	0.28	1.25E-02	6.19E-04	0.15	4.74E-06	0.43	1.5	1.53E+02	71.87	2.55E+04	0.006	9.50E+08
76-44-8	Heptachlor	1.94E+05	4.53E-07	0.28	1.12E-02	4.47E-02	0.15	5.69E-06	0.43	1.5	5.72E+01	71.87	9.53E+03	0.006	9.50E+08
1024-57-3	Heptachlor Epoxide	5.39E+06	5.89E-10	0.28	1.32E-02	3.90E-04	0.15	4.23E-06	0.43	1.5	4.99E+02	71.87	8.32E+04	0.006	9.50E+08
	cis-nonachlor	---	---	0.28			0.15		0.43	1.5		71.87		0.006	9.50E+08
	trans-nonachlor	---	---	0.28			0.15		0.43	1.5		71.87		0.006	9.50E+08

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TABLE I-3
MODELED EPCs, HIs AND RISK ESTIMATES FOR SOIL DUST AND VAPOR PATHWAYS
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Surface and Subsurface Soil (0 to 10 feet)
Exposure Point: Fugitive dust and vapors
Receptor Population: Resident
Receptor Age: Adult

Chemical of Potential Concern	Soil EPC (mg/kg)		Fugitive dust EPC (mg/m^3)		Soil vapor EPC (mg/m^3)		Air (total) EPC (mg/m^3)		Chronic Total Hazard Index		Cancer Total Risk Estimates	
	RME	CT	RME	CT	RME	CT	RME	CT	RME	CT	RME	CT
sec-Butylbenzene	1.8E-01	1.8E-01	3.5E-10	3.5E-10	---	---	3.5E-10	3.5E-10	---	---	---	---
1,2-Dichloroethene (cis)	1.1E+01	1.8E-01	2.1E-08	3.5E-10	3.6E-03	5.9E-05	3.6E-03	5.9E-05	---	---	---	---
para-Isopropyltoluene	1.9E-01	1.9E-01	3.6E-10	3.6E-10	---	---	3.6E-10	3.6E-10	---	---	---	---
n-Propylbenzene	2.1E-01	2.1E-01	4.0E-10	4.0E-10	---	---	4.0E-10	4.0E-10	---	---	---	---
Tetrachloroethene	1.3E-01	1.3E-01	2.5E-10	2.5E-10	3.9E-05	3.9E-05	3.9E-05	3.9E-05	6.E-06	2.E-06	7.E-10	5.E-11
1,2,4-Trimethylbenzene	2.8E+00	2.8E+00	5.4E-09	5.4E-09	2.6E-04	2.6E-04	2.6E-04	2.6E-04	---	---	---	---
1,3,5-Trimethylbenzene	7.4E-01	7.4E-01	1.4E-09	1.4E-09	---	---	1.4E-09	1.4E-09	---	---	---	---
C9-C18 Aliphatics	1.1E+03	1.1E+03	2.1E-06	2.1E-06	6.6E-02	6.6E-02	6.6E-02	6.6E-02	6.E-03	2.E-03	---	---
C11-C22 Aromatics	6.6E+02	6.6E+02	1.3E-06	1.3E-06	8.9E-03	8.9E-03	8.9E-03	8.9E-03	4.E-03	1.E-03	---	---
Naphthalene	8.0E-01	8.0E-01	1.5E-09	1.5E-09	1.8E-05	1.8E-05	1.8E-05	1.8E-05	6.E-04	1.E-04	---	---
Benz(a)anthracene	8.8E-01	8.8E-01	1.7E-09	1.7E-09	9.4E-08	9.4E-08	9.6E-08	9.6E-08	---	---	3.E-10	2.E-11
Benzo(a)pyrene	2.0E+00	3.7E-01	3.8E-09	7.1E-10	8.1E-08	1.5E-08	8.4E-08	1.6E-08	---	---	2.E-09	3.E-11
Benzo(b)fluoranthene	5.4E-01	5.4E-01	1.0E-09	1.0E-09	1.1E-07	1.1E-07	1.1E-07	1.1E-07	---	---	3.E-10	2.E-11
Benzo(k)fluoranthene	1.7E+00	3.3E-01	3.3E-09	6.3E-10	4.2E-08	8.1E-09	4.5E-08	8.7E-09	---	---	1.E-11	2.E-13
Chrysene	7.5E-01	7.5E-01	1.4E-09	1.4E-09	2.6E-07	2.6E-07	2.6E-07	2.6E-07	---	---	8.E-12	6.E-13
Dibenzo(ah)anthracene	2.2E-01	2.2E-01	4.2E-10	4.2E-10	3.0E-09	3.0E-09	3.4E-09	3.4E-09	---	---	1.E-10	7.E-12
Indeno(123-cd)pyrene	3.6E-01	3.6E-01	6.9E-10	6.9E-10	6.1E-09	6.1E-09	6.8E-09	6.8E-09	---	---	2.E-11	1.E-12
bis(2-Ethylhexyl)phthalate	3.4E+01	3.4E+01	6.5E-08	6.5E-08	1.8E-06	1.8E-06	1.8E-06	1.8E-06	---	---	2.E-10	2.E-11
PCBs (total)	9.8E+01	9.8E+01	1.9E-07	1.9E-07	---	---	1.9E-07	1.9E-07	---	---	---	---
PCBs (minus dioxin like congeners)	8.0E+01	8.0E+01	1.5E-07	1.5E-07	---	---	1.5E-07	1.5E-07	---	---	3.E-09	1.E-10
PCB-77	3.0E+00	2.8E-01	5.8E-09	5.4E-10	---	---	5.8E-09	5.4E-10	---	---	6.E-10	4.E-12
PCB-81	5.3E-02	5.3E-02	1.0E-10	1.0E-10	---	---	1.0E-10	1.0E-10	---	---	1.E-11	8.E-13
PCB-105	2.2E+00	2.2E+00	4.2E-09	4.2E-09	---	---	4.2E-09	4.2E-09	---	---	5.E-10	3.E-11
PCB-114	1.4E-01	1.4E-01	2.7E-10	2.7E-10	---	---	2.7E-10	2.7E-10	---	---	1.E-10	1.E-11
PCB-118	3.3E+00	3.3E+00	6.3E-09	6.3E-09	---	---	6.3E-09	6.3E-09	---	---	7.E-10	5.E-11
PCB-123	1.8E-01	1.8E-01	3.5E-10	3.5E-10	---	---	3.5E-10	3.5E-10	---	---	4.E-11	3.E-12
PCB-126	7.6E-03	7.6E-03	1.5E-11	1.5E-11	---	---	1.5E-11	1.5E-11	---	---	2.E-09	1.E-10
PCB-156	5.0E-02	5.0E-02	9.6E-11	9.6E-11	---	---	9.6E-11	9.6E-11	---	---	5.E-11	4.E-12
PCB-157	1.1E-02	1.1E-02	2.1E-11	2.1E-11	---	---	2.1E-11	2.1E-11	---	---	1.E-11	8.E-13
PCB-167	8.7E-02	8.7E-02	1.7E-10	1.7E-10	---	---	1.7E-10	1.7E-10	---	---	2.E-12	1.E-13
PCB-189	3.0E-03	3.0E-03	5.8E-12	5.8E-12	---	---	5.8E-12	5.8E-12	---	---	6.E-13	5.E-14
2,3,7,8-TCDD	3.9E-07	3.0E-07	7.5E-16	5.8E-16	---	---	7.5E-16	5.8E-16	---	---	8.E-13	5.E-14
1,2,3,7,8-PeCDD	3.6E-06	1.8E-06	6.9E-15	3.5E-15	---	---	6.9E-15	3.5E-15	---	---	8.E-12	3.E-13
1,2,3,4,7,8-HxCDD	5.1E-06	2.9E-06	9.8E-15	5.6E-15	---	---	9.8E-15	5.6E-15	---	---	1.E-12	4.E-14

TABLE I-3
MODELED EPCs, HIs AND RISK ESTIMATES FOR SOIL DUST AND VAPOR PATHWAYS
Beede Waste Oil/Cash Energy Site

Chemical of Potential Concern	Soil EPC (mg/kg)		Fugitive dust EPC (mg/m^3)		Soil vapor EPC (mg/m^3)		Air (total) EPC (mg/m^3)		Chronic Total Hazard Index		Cancer Total Risk Estimates	
	RME	CT	RME	CT	RME	CT	RME	CT	RME	CT	RME	CT
1,2,3,6,7,8-HxCDD	1.2E-05	7.7E-06	2.3E-14	1.5E-14	---	---	2.3E-14	1.5E-14	---	---	3.E-12	1.E-13
1,2,3,7,8,9-HxCDD	1.0E-05	5.7E-06	1.9E-14	1.1E-14	---	---	1.9E-14	1.1E-14	---	---	2.E-12	9.E-14
1,2,3,4,6,7,8-HpCDD	2.5E-04	1.3E-04	4.8E-13	2.5E-13	---	---	4.8E-13	2.5E-13	---	---	5.E-12	2.E-13
OCDD	2.0E-03	1.0E-03	3.8E-12	1.9E-12	---	---	3.8E-12	1.9E-12	---	---	4.E-13	2.E-14
2,3,7,8-TCDF	5.9E-05	2.0E-05	1.1E-13	3.8E-14	---	---	1.1E-13	3.8E-14	---	---	1.E-11	3.E-13
1,2,3,7,8-PeCDF	2.2E-05	7.7E-06	4.2E-14	1.5E-14	---	---	4.2E-14	1.5E-14	---	---	2.E-12	6.E-14
2,3,4,7,8-PeCDF	1.4E-04	5.5E-05	2.7E-13	1.1E-13	---	---	2.7E-13	1.1E-13	---	---	1.E-10	4.E-12
1,2,3,4,7,8-HxCDF	3.2E-05	1.5E-05	6.1E-14	2.9E-14	---	---	6.1E-14	2.9E-14	---	---	7.E-12	2.E-13
1,2,3,6,7,8-HxCDF	1.9E-05	8.8E-06	3.6E-14	1.7E-14	---	---	3.6E-14	1.7E-14	---	---	4.E-12	1.E-13
1,2,3,7,8,9-HxCDF	1.1E-05	4.3E-06	2.1E-14	8.3E-15	---	---	2.1E-14	8.3E-15	---	---	2.E-12	7.E-14
2,3,4,6,7,8-HxCDF	2.1E-05	1.0E-05	4.0E-14	1.9E-14	---	---	4.0E-14	1.9E-14	---	---	4.E-12	2.E-13
1,2,3,4,6,7,8-HpCDF	6.3E-05	3.4E-05	1.2E-13	6.5E-14	---	---	1.2E-13	6.5E-14	---	---	1.E-12	5.E-14
1,2,3,4,7,8,9-HpCDF	7.8E-06	3.8E-06	1.5E-14	7.3E-15	---	---	1.5E-14	7.3E-15	---	---	2.E-13	6.E-15
OCDF	1.0E-04	5.2E-05	1.9E-13	1.0E-13	---	---	1.9E-13	1.0E-13	---	---	2.E-14	8.E-16
Antimony	7.4E-01	7.4E-01	1.4E-09	1.4E-09	---	---	1.4E-09	1.4E-09	7.E-07	2.E-07	---	---
Arsenic	6.6E+00	6.6E+00	1.3E-08	1.3E-08	---	---	1.3E-08	1.3E-08	---	---	2.E-09	1.E-10
Barium	7.8E+01	7.8E+01	1.5E-07	1.5E-07	---	---	1.5E-07	1.5E-07	3.E-05	7.E-06	---	---
Beryllium	1.8E+00	4.0E-01	3.5E-09	7.7E-10	---	---	3.5E-09	7.7E-10	2.E-05	9.E-07	3.E-10	4.E-12
Cadmium (Food)	4.4E+01	1.3E+00	8.4E-08	2.5E-09	---	---	8.4E-08	2.5E-09	---	---	5.E-09	1.E-11
Chromium VI (particulates)	5.3E+02	2.6E+01	1.0E-06	5.0E-08	---	---	1.0E-06	5.0E-08	1.E-03	1.E-05	4.E-07	1.E-09
Copper	4.7E+01	4.7E+01	9.0E-08	9.0E-08	---	---	9.0E-08	9.0E-08	---	---	---	---
Lead	4.9E+02	4.9E+02	9.4E-07	9.4E-07	---	---	9.4E-07	9.4E-07	---	---	---	---
Manganese	1.1E+03	1.6E+02	2.1E-06	3.1E-07	---	---	2.1E-06	3.1E-07	4.E-03	1.E-04	---	---
Mercury	2.4E+01	6.1E+00	4.6E-08	1.2E-08	---	---	4.6E-08	1.2E-08	1.E-05	9.E-07	---	---
Molybdenum	9.3E+01	2.4E+00	1.8E-07	4.6E-09	---	---	1.8E-07	4.6E-09	---	---	---	---
Nickel	9.2E+02	2.3E+01	1.8E-06	4.4E-08	---	---	1.8E-06	4.4E-08	---	---	---	---
Vanadium	1.8E+01	1.8E+01	3.5E-08	3.5E-08	---	---	3.5E-08	3.5E-08	---	---	---	---
Zinc	1.3E+02	1.3E+02	2.5E-07	2.5E-07	---	---	2.5E-07	2.5E-07	---	---	---	---

(1) Total Hazard Index or Cancer Risk Across Air Exposure Routes	2.E-02	3.E-03	4.E-07	2.E-09
(2) Total Hazard Index or Cancer Risk Across All Media and All Exposure Routes	8.E+01	7.E+00	4.E-02	2.E-04

(1) The "Total Hazard Index or Cancer Risk Across Air Exposure Routes" is the HI or risk for the modeled soil dust and vapor inhalation pathways.
(2) The "Total Hazard Index or Cancer Risk Across All Media and All Exposure Routes" is the HI or risk for the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.

TABLE I-4
MODELED EPCs, HIs AND RISK ESTIMATES FOR SOIL DUST AND VAPOR PATHWAYS
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Surface and Subsurface Soil (0 to 10 feet)
Exposure Point: Fugitive dust and vapors
Receptor Population: Resident
Receptor Age: Child

Chemical of Potential Concern	Soil EPC (mg/kg)		Fugitive dust EPC (mg/m^3)		Soil vapor EPC (mg/m^3)		Air (total) EPC (mg/m^3)		Chronic Total Hazard Index		Cancer Total Risk Estimates	
	RME	CT	RME	CT	RME	CT	RME	CT	RME	CT	RME	CT
sec-Butylbenzene	1.8E-01	1.8E-01	3.5E-10	3.5E-10	---	---	3.5E-10	3.5E-10	---	---	---	---
1,2-Dichloroethene (cis)	1.1E+01	1.8E-01	2.1E-08	3.5E-10	3.6E-03	5.9E-05	3.6E-03	5.9E-05	---	---	---	---
para-Isopropyltoluene	1.9E-01	1.9E-01	3.6E-10	3.6E-10	---	---	3.6E-10	3.6E-10	---	---	---	---
n-Propylbenzene	2.1E-01	2.1E-01	4.0E-10	4.0E-10	---	---	4.0E-10	4.0E-10	---	---	---	---
Tetrachloroethene	1.3E-01	1.3E-01	2.5E-10	2.5E-10	3.9E-05	3.9E-05	3.9E-05	3.9E-05	2.E-05	4.E-06	5.E-10	4.E-11
1,2,4-Trimethylbenzene	2.8E+00	2.8E+00	5.4E-09	5.4E-09	2.6E-04	2.6E-04	2.6E-04	2.6E-04	---	---	---	---
1,3,5-Trimethylbenzene	7.4E-01	7.4E-01	1.4E-09	1.4E-09	---	---	1.4E-09	1.4E-09	---	---	---	---
C9-C18 Aliphatics	1.1E+03	1.1E+03	2.1E-06	2.1E-06	6.6E-02	6.6E-02	6.6E-02	6.6E-02	2.E-02	4.E-03	---	---
C11-C22 Aromatics	6.6E+02	6.6E+02	1.3E-06	1.3E-06	8.9E-03	8.9E-03	8.9E-03	8.9E-03	1.E-02	2.E-03	---	---
Naphthalene	8.0E-01	8.0E-01	1.5E-09	1.5E-09	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.E-03	3.E-04	---	---
Benz(a)anthracene	8.8E-01	8.8E-01	1.7E-09	1.7E-09	9.4E-08	9.4E-08	9.6E-08	9.6E-08	---	---	2.E-10	1.E-11
Benzo(a)pyrene	2.0E+00	3.7E-01	3.8E-09	7.1E-10	8.1E-08	1.5E-08	8.4E-08	1.6E-08	---	---	2.E-09	2.E-11
Benzo(b)fluoranthene	5.4E-01	5.4E-01	1.0E-09	1.0E-09	1.1E-07	1.1E-07	1.1E-07	1.1E-07	---	---	2.E-10	2.E-11
Benzo(k)fluoranthene	1.7E+00	3.3E-01	3.3E-09	6.3E-10	4.2E-08	8.1E-09	4.5E-08	8.7E-09	---	---	8.E-12	1.E-13
Chrysene	7.5E-01	7.5E-01	1.4E-09	1.4E-09	2.6E-07	2.6E-07	2.6E-07	2.6E-07	---	---	5.E-12	4.E-13
Dibenzo(ah)anthracene	2.2E-01	2.2E-01	4.2E-10	4.2E-10	3.0E-09	3.0E-09	3.4E-09	3.4E-09	---	---	6.E-11	5.E-12
Indeno(123-cd)pyrene	3.6E-01	3.6E-01	6.9E-10	6.9E-10	6.1E-09	6.1E-09	6.8E-09	6.8E-09	---	---	1.E-11	9.E-13
bis(2-Ethylhexyl)phthalate	3.4E+01	3.4E+01	6.5E-08	6.5E-08	1.8E-06	1.8E-06	1.8E-06	1.8E-06	---	---	2.E-10	1.E-11
PCBs (total)	9.8E+01	9.8E+01	1.9E-07	1.9E-07	---	---	1.9E-07	1.9E-07	---	---	---	---
PCBs (minus dioxin like congeners)	8.0E+01	8.0E+01	1.5E-07	1.5E-07	---	---	1.5E-07	1.5E-07	---	---	2.E-09	7.E-11
PCB-77	3.0E+00	2.8E-01	5.8E-09	5.4E-10	---	---	5.8E-09	5.4E-10	---	---	4.E-10	3.E-12
PCB-81	5.3E-02	5.3E-02	1.0E-10	1.0E-10	---	---	1.0E-10	1.0E-10	---	---	7.E-12	5.E-13
PCB-105	2.2E+00	2.2E+00	4.2E-09	4.2E-09	---	---	4.2E-09	4.2E-09	---	---	3.E-10	2.E-11
PCB-114	1.4E-01	1.4E-01	2.7E-10	2.7E-10	---	---	2.7E-10	2.7E-10	---	---	9.E-11	7.E-12
PCB-118	3.3E+00	3.3E+00	6.3E-09	6.3E-09	---	---	6.3E-09	6.3E-09	---	---	4.E-10	3.E-11
PCB-123	1.8E-01	1.8E-01	3.5E-10	3.5E-10	---	---	3.5E-10	3.5E-10	---	---	2.E-11	2.E-12
PCB-126	7.6E-03	7.6E-03	1.5E-11	1.5E-11	---	---	1.5E-11	1.5E-11	---	---	1.E-09	8.E-11
PCB-156	5.0E-02	5.0E-02	9.6E-11	9.6E-11	---	---	9.6E-11	9.6E-11	---	---	3.E-11	2.E-12
PCB-157	1.1E-02	1.1E-02	2.1E-11	2.1E-11	---	---	2.1E-11	2.1E-11	---	---	7.E-12	5.E-13
PCB-167	8.7E-02	8.7E-02	1.7E-10	1.7E-10	---	---	1.7E-10	1.7E-10	---	---	1.E-12	9.E-14
PCB-189	3.0E-03	3.0E-03	5.8E-12	5.8E-12	---	---	5.8E-12	5.8E-12	---	---	4.E-13	3.E-14
2,3,7,8-TCDD	3.9E-07	3.0E-07	7.5E-16	5.8E-16	---	---	7.5E-16	5.8E-16	---	---	5.E-13	3.E-14
1,2,3,7,8-PeCDD	3.6E-06	1.8E-06	6.9E-15	3.5E-15	---	---	6.9E-15	3.5E-15	---	---	5.E-12	2.E-13
1,2,3,4,7,8-HxCDD	5.1E-06	2.9E-06	9.8E-15	5.6E-15	---	---	9.8E-15	5.6E-15	---	---	7.E-13	3.E-14

TABLE I-4
MODELED EPCs, HIs AND RISK ESTIMATES FOR SOIL DUST AND VAPOR PATHWAYS
Beede Waste Oil/Cash Energy Site

Chemical of Potential Concern	Soil EPC (mg/kg)		Fugitive dust EPC (mg/m^3)		Soil vapor EPC (mg/m^3)		Air (total) EPC (mg/m^3)		Chronic Total Hazard Index		Cancer Total Risk Estimates	
	RME	CT	RME	CT	RME	CT	RME	CT	RME	CT	RME	CT
1,2,3,6,7,8-HxCDD	1.2E-05	7.7E-06	2.3E-14	1.5E-14	---	---	2.3E-14	1.5E-14	---	---	2.E-12	8.E-14
1,2,3,7,8,9-HxCDD	1.0E-05	5.7E-06	1.9E-14	1.1E-14	---	---	1.9E-14	1.1E-14	---	---	1.E-12	6.E-14
1,2,3,4,6,7,8-HpCDD	2.5E-04	1.3E-04	4.8E-13	2.5E-13	---	---	4.8E-13	2.5E-13	---	---	3.E-12	1.E-13
OCDD	2.0E-03	1.0E-03	3.8E-12	1.9E-12	---	---	3.8E-12	1.9E-12	---	---	3.E-13	1.E-14
2,3,7,8-TCDF	5.9E-05	2.0E-05	1.1E-13	3.8E-14	---	---	1.1E-13	3.8E-14	---	---	8.E-12	2.E-13
1,2,3,7,8-PeCDF	2.2E-05	7.7E-06	4.2E-14	1.5E-14	---	---	4.2E-14	1.5E-14	---	---	1.E-12	4.E-14
2,3,4,7,8-PeCDF	1.4E-04	5.5E-05	2.7E-13	1.1E-13	---	---	2.7E-13	1.1E-13	---	---	9.E-11	3.E-12
1,2,3,4,7,8-HxCDF	3.2E-05	1.5E-05	6.1E-14	2.9E-14	---	---	6.1E-14	2.9E-14	---	---	4.E-12	1.E-13
1,2,3,6,7,8-HxCDF	1.9E-05	8.8E-06	3.6E-14	1.7E-14	---	---	3.6E-14	1.7E-14	---	---	3.E-12	9.E-14
1,2,3,7,8,9-HxCDF	1.1E-05	4.3E-06	2.1E-14	8.3E-15	---	---	2.1E-14	8.3E-15	---	---	1.E-12	4.E-14
2,3,4,6,7,8-HxCDF	2.1E-05	1.0E-05	4.0E-14	1.9E-14	---	---	4.0E-14	1.9E-14	---	---	3.E-12	1.E-13
1,2,3,4,6,7,8-HpCDF	6.3E-05	3.4E-05	1.2E-13	6.5E-14	---	---	1.2E-13	6.5E-14	---	---	9.E-13	3.E-14
1,2,3,4,7,8,9-HpCDF	7.8E-06	3.8E-06	1.5E-14	7.3E-15	---	---	1.5E-14	7.3E-15	---	---	1.E-13	4.E-15
OCDF	1.0E-04	5.2E-05	1.9E-13	1.0E-13	---	---	1.9E-13	1.0E-13	---	---	1.E-14	5.E-16
Antimony	7.4E-01	7.4E-01	1.4E-09	1.4E-09	---	---	1.4E-09	1.4E-09	2.E-06	4.E-07	---	---
Arsenic	6.6E+00	6.6E+00	1.3E-08	1.3E-08	---	---	1.3E-08	1.3E-08	---	---	1.E-09	9.E-11
Barium	7.8E+01	7.8E+01	1.5E-07	1.5E-07	---	---	1.5E-07	1.5E-07	7.E-05	2.E-05	---	---
Beryllium	1.8E+00	4.0E-01	3.5E-09	7.7E-10	---	---	3.5E-09	7.7E-10	4.E-05	2.E-06	2.E-10	3.E-12
Cadmium (Food)	4.4E+01	1.3E+00	8.4E-08	2.5E-09	---	---	8.4E-08	2.5E-09	---	---	3.E-09	7.E-12
Chromium VI (particulates)	5.3E+02	2.6E+01	1.0E-06	5.0E-08	---	---	1.0E-06	5.0E-08	3.E-03	3.E-05	3.E-07	9.E-10
Copper	4.7E+01	4.7E+01	9.0E-08	9.0E-08	---	---	9.0E-08	9.0E-08	---	---	---	---
Lead	4.9E+02	4.9E+02	9.4E-07	9.4E-07	---	---	9.4E-07	9.4E-07	---	---	---	---
Manganese	1.1E+03	1.6E+02	2.1E-06	3.1E-07	---	---	2.1E-06	3.1E-07	1.E-02	3.E-04	---	---
Mercury	2.4E+01	6.1E+00	4.6E-08	1.2E-08	---	---	4.6E-08	1.2E-08	4.E-05	2.E-06	---	---
Molybdenum	9.3E+01	2.4E+00	1.8E-07	4.6E-09	---	---	1.8E-07	4.6E-09	---	---	---	---
Nickel	9.2E+02	2.3E+01	1.8E-06	4.4E-08	---	---	1.8E-06	4.4E-08	---	---	---	---
Vanadium	1.8E+01	1.8E+01	3.5E-08	3.5E-08	---	---	3.5E-08	3.5E-08	---	---	---	---
Zinc	1.3E+02	1.3E+02	2.5E-07	2.5E-07	---	---	2.5E-07	2.5E-07	---	---	---	---

(1) Total Hazard Index or Cancer Risk Across Air Exposure Routes	4.E-02	7.E-03	3.E-07	1.E-09
(2) Total Hazard Index or Cancer Risk Across All Media and All Exposure Routes	3.E+02	3.E+01	3.E-02	2.E-04

(1) The "Total Hazard Index or Cancer Risk Across Air Exposure Routes" is the HI or risk for the modeled soil dust and vapor inhalation pathways.
(2) The "Total Hazard Index or Cancer Risk Across All Media and All Exposure Routes" is the HI or risk for the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.

TABLE I-5
MODELED EPCs, HIs AND RISK ESTIMATES FOR SOIL DUST AND VAPOR PATHWAYS
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Surface Soil (0 to 1 foot)
Exposure Point: Fugitive dust and vapors
Receptor Population: Resident
Receptor Age: Adult

Chemical of Potential Concern	Soil EPC (mg/kg)		Fugitive dust EPC (mg/m^3)		Soil vapor EPC (mg/m^3)		Air (total) EPC (mg/m^3)		Chronic Total Hazard Index		Cancer Total Risk Estimates	
	RME	CT	RME	CT	RME	CT	RME	CT	RME	CT	RME	CT
1,2-Dichloroethene (cis)	4.0E-03	4.0E-03	7.7E-12	7.7E-12	1.3E-06	1.3E-06	1.3E-06	1.3E-06	---	---	---	---
para-Isopropyltoluene	8.4E-03	8.4E-03	1.6E-11	1.6E-11	---	---	1.6E-11	1.6E-11	---	---	---	---
Tetrachloroethene	2.3E+00	1.6E-01	4.4E-09	3.1E-10	6.9E-04	4.8E-05	6.9E-04	4.8E-05	1.E-04	2.E-06	1.E-08	7.E-11
1,2,4-Trimethylbenzene	4.8E+00	2.2E-01	9.2E-09	4.2E-10	4.4E-04	2.0E-05	4.4E-04	2.0E-05	---	---	---	---
1,3,5-Trimethylbenzene	5.3E+00	2.4E-01	1.0E-08	4.6E-10	---	---	1.0E-08	4.6E-10	---	---	---	---
C9-C18 Aliphatics	4.6E+03	4.8E+02	8.8E-06	9.2E-07	2.7E-01	2.9E-02	2.7E-01	2.9E-02	3.E-02	7.E-04	---	---
C11-C22 Aromatics	8.2E+03	8.8E+02	1.6E-05	1.7E-06	1.1E-01	1.2E-02	1.1E-01	1.2E-02	5.E-02	1.E-03	---	---
Naphthalene	5.9E-01	7.1E-02	1.1E-09	1.4E-10	1.3E-05	1.6E-06	1.3E-05	1.6E-06	4.E-04	1.E-05	---	---
Benz(a)anthracene	3.7E+00	3.7E+00	7.1E-09	7.1E-09	4.0E-07	4.0E-07	4.0E-07	4.0E-07	---	---	1.E-09	9.E-11
Benzo(a)pyrene	2.0E+00	4.7E-01	3.8E-09	9.0E-10	8.1E-08	1.9E-08	8.4E-08	2.0E-08	---	---	2.E-09	4.E-11
Benzo(b)fluoranthene	1.2E+00	1.2E+00	2.3E-09	2.3E-09	2.5E-07	2.5E-07	2.5E-07	2.5E-07	---	---	7.E-10	5.E-11
Benzo(k)fluoranthene	1.7E+00	4.3E-01	3.3E-09	8.3E-10	4.2E-08	1.1E-08	4.5E-08	1.1E-08	---	---	1.E-11	2.E-13
Chrysene	2.1E+00	2.1E+00	4.0E-09	4.0E-09	7.4E-07	7.4E-07	7.4E-07	7.4E-07	---	---	2.E-11	2.E-12
Dibenzo(ah)anthracene	2.8E-01	2.8E-01	5.4E-10	5.4E-10	3.8E-09	3.8E-09	4.4E-09	4.4E-09	---	---	1.E-10	9.E-12
Indeno(123-cd)pyrene	6.6E-01	6.6E-01	1.3E-09	1.3E-09	1.1E-08	1.1E-08	1.2E-08	1.2E-08	---	---	4.E-11	3.E-12
bis(2-Ethylhexyl)phthalate	1.3E+02	2.3E+01	2.5E-07	4.4E-08	6.8E-06	1.2E-06	7.1E-06	1.2E-06	---	---	9.E-10	1.E-11
PCBs (total)	3.8E+02	3.8E+02	7.3E-07	7.3E-07	---	---	7.3E-07	7.3E-07	---	---	---	---
PCBs (minus dioxin like congeners)	3.7E+02	3.7E+02	7.0E-07	7.1E-07	---	---	7.1E-07	7.1E-07	---	---	1.E-08	5.E-10
PCB-77	3.0E+00	7.3E-01	5.76E-09	1.4E-09	---	---	5.8E-09	1.4E-09	---	---	6.E-10	1.E-11
PCB-81	9.8E-02	3.3E-02	1.88E-10	6.3E-11	---	---	1.9E-10	6.3E-11	---	---	2.E-11	5.E-13
PCB-105	4.4E+00	1.0E+00	8.45E-09	1.9E-09	---	---	8.4E-09	1.9E-09	---	---	9.E-10	2.E-11
PCB-114	4.4E-01	1.0E-01	8.45E-10	1.9E-10	---	---	8.4E-10	1.9E-10	---	---	5.E-10	8.E-12
PCB-118	7.2E+00	1.7E+00	1.38E-08	3.3E-09	---	---	1.4E-08	3.3E-09	---	---	2.E-09	3.E-11
PCB-123	7.4E-01	1.8E-01	1.42E-09	3.5E-10	---	---	1.4E-09	3.5E-10	---	---	2.E-10	3.E-12
PCB-126	2.8E-02	8.0E-03	5.38E-11	1.5E-11	---	---	5.4E-11	1.5E-11	---	---	6.E-09	1.E-10
PCB-156	2.2E-01	5.8E-02	4.22E-10	1.1E-10	---	---	4.2E-10	1.1E-10	---	---	2.E-10	4.E-12
PCB-157	5.4E-02	1.3E-02	1.04E-10	2.5E-11	---	---	1.0E-10	2.5E-11	---	---	6.E-11	1.E-12
PCB-167	4.2E-01	1.1E-01	8.06E-10	2.1E-10	---	---	8.1E-10	2.1E-10	---	---	9.E-12	2.E-13
PCB-189	8.3E-03	8.3E-03	1.59E-11	1.6E-11	---	---	1.6E-11	1.6E-11	---	---	2.E-12	1.E-13
2,3,7,8-TCDD	3.9E-07	3.0E-07	7.5E-16	5.8E-16	---	---	7.5E-16	5.8E-16	---	---	8.E-13	5.E-14
1,2,3,7,8-PeCDD	3.6E-06	1.8E-06	6.9E-15	3.5E-15	---	---	6.9E-15	3.5E-15	---	---	8.E-12	3.E-13
1,2,3,4,7,8-HxCDD	5.1E-06	2.9E-06	9.8E-15	5.6E-15	---	---	9.8E-15	5.6E-15	---	---	1.E-12	4.E-14
1,2,3,6,7,8-HxCDD	1.2E-05	7.7E-06	2.3E-14	1.5E-14	---	---	2.3E-14	1.5E-14	---	---	3.E-12	1.E-13
1,2,3,7,8,9-HxCDD	1.0E-05	5.7E-06	1.9E-14	1.1E-14	---	---	1.9E-14	1.1E-14	---	---	2.E-12	9.E-14

TABLE I-5
MODELED EPCs, HIs AND RISK ESTIMATES FOR SOIL DUST AND VAPOR PATHWAYS
Beede Waste Oil/Cash Energy Site

Chemical of Potential Concern	Soil EPC (mg/kg)		Fugitive dust EPC (mg/m^3)		Soil vapor EPC (mg/m^3)		Air (total) EPC (mg/m^3)		Chronic Total Hazard Index		Cancer Total Risk Estimates	
	RME	CT	RME	CT	RME	CT	RME	CT	RME	CT	RME	CT
1,2,3,4,6,7,8-HpCDD	2.5E-04	1.3E-04	4.8E-13	2.5E-13	---	---	4.8E-13	2.5E-13	---	---	5.E-12	2.E-13
OCDD	2.0E-03	1.0E-03	3.8E-12	1.9E-12	---	---	3.8E-12	1.9E-12	---	---	4.E-13	2.E-14
2,3,7,8-TCDF	5.9E-05	2.0E-05	1.1E-13	3.8E-14	---	---	1.1E-13	3.8E-14	---	---	1.E-11	3.E-13
1,2,3,7,8-PeCDF	2.2E-05	7.7E-06	4.2E-14	1.5E-14	---	---	4.2E-14	1.5E-14	---	---	2.E-12	6.E-14
2,3,4,7,8-PeCDF	1.4E-04	5.5E-05	2.7E-13	1.1E-13	---	---	2.7E-13	1.1E-13	---	---	1.E-10	4.E-12
1,2,3,4,7,8-HxCDF	3.2E-05	1.5E-05	6.1E-14	2.9E-14	---	---	6.1E-14	2.9E-14	---	---	7.E-12	2.E-13
1,2,3,6,7,8-HxCDF	1.9E-05	8.8E-06	3.6E-14	1.7E-14	---	---	3.6E-14	1.7E-14	---	---	4.E-12	1.E-13
1,2,3,7,8,9-HxCDF	1.1E-05	4.3E-06	2.1E-14	8.3E-15	---	---	2.1E-14	8.3E-15	---	---	2.E-12	7.E-14
2,3,4,6,7,8-HxCDF	2.1E-05	1.0E-05	4.0E-14	1.9E-14	---	---	4.0E-14	1.9E-14	---	---	4.E-12	2.E-13
1,2,3,4,6,7,8-HpCDF	6.3E-05	3.4E-05	1.2E-13	6.5E-14	---	---	1.2E-13	6.5E-14	---	---	1.E-12	5.E-14
1,2,3,4,7,8,9-HpCDF	7.8E-06	3.8E-06	1.5E-14	7.3E-15	---	---	1.5E-14	7.3E-15	---	---	2.E-13	6.E-15
OCDF	1.0E-04	5.2E-05	1.9E-13	1.0E-13	---	---	1.9E-13	1.0E-13	---	---	2.E-14	8.E-16
Antimony	6.2E-01	6.2E-01	1.2E-09	1.2E-09	---	---	1.2E-09	1.2E-09	6.E-07	1.E-07	---	---
Arsenic	7.0E+00	7.0E+00	1.3E-08	1.3E-08	---	---	1.3E-08	1.3E-08	---	---	2.E-09	1.E-10
Barium	3.2E+03	1.4E+02	6.1E-06	2.7E-07	---	---	6.1E-06	2.7E-07	1.E-03	1.E-05	---	---
Beryllium	3.6E-01	3.6E-01	6.9E-10	6.9E-10	---	---	6.9E-10	6.9E-10	3.E-06	8.E-07	5.E-11	4.E-12
Cadmium (Food)	2.3E+01	1.1E+00	4.4E-08	2.1E-09	---	---	4.4E-08	2.1E-09	---	---	3.E-09	9.E-12
Chromium VI (particulates)	5.3E+02	3.1E+01	1.0E-06	6.0E-08	---	---	1.0E-06	6.0E-08	1.E-03	1.E-05	4.E-07	2.E-09
Copper	2.1E+01	2.1E+01	4.0E-08	4.0E-08	---	---	4.0E-08	4.0E-08	---	---	---	---
Lead	9.0E+02	9.0E+02	1.7E-06	1.7E-06	---	---	1.7E-06	1.7E-06	---	---	---	---
Manganese	2.6E+02	1.1E+02	5.0E-07	2.1E-07	---	---	5.0E-07	2.1E-07	1.E-03	1.E-04	---	---
Mercury	3.0E-01	3.0E-01	5.8E-10	5.8E-10	---	---	5.8E-10	5.8E-10	2.E-07	5.E-08	---	---
Molybdenum	3.6E+00	3.6E+00	6.9E-09	6.9E-09	---	---	6.9E-09	6.9E-09	---	---	---	---
Nickel	9.2E+02	3.8E+01	1.8E-06	7.3E-08	---	---	1.8E-06	7.3E-08	---	---	---	---
Vanadium	1.6E+01	1.6E+01	3.1E-08	3.1E-08	---	---	3.1E-08	3.1E-08	---	---	---	---
Zinc	1.6E+03	1.0E+02	3.1E-06	1.9E-07	---	---	3.1E-06	1.9E-07	---	---	---	---

(1) Total Hazard Index or Cancer Risk Across Air Exposure Routes	8.E-02	2.E-03	5.E-07	3.E-09
(2) Total Hazard Index or Cancer Risk Across All Media and All Exposure Routes	9.E+01	1.E+01	4.E-02	2.E-04

(1) The "Total Hazard Index or Cancer Risk Across Air Exposure Routes" is the HI or risk for the modeled soil dust and vapor inhalation pathways.
(2) The "Total Hazard Index or Cancer Risk Across All Media and All Exposure Routes" is the HI or risk for the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.

TABLE I-6
MODELED EPCs, HIs AND RISK ESTIMATES FOR SOIL DUST AND VAPOR PATHWAYS
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Surface Soil (0 to 1 foot)
Exposure Point: Fugitive dust and vapors
Receptor Population: Resident
Receptor Age: Child

Chemical of Potential Concern	Soil EPC (mg/kg)		Fugitive dust EPC (mg/m^3)		Soil vapor EPC (mg/m^3)		Air (total) EPC (mg/m^3)		Chronic Total Hazard Index		Cancer Total Risk Estimates	
	RME	CT	RME	CT	RME	CT	RME	CT	RME	CT	RME	CT
1,2-Dichloroethene (cis)	4.0E-03	4.0E-03	7.7E-12	7.7E-12	1.3E-06	1.3E-06	1.3E-06	1.3E-06	---	---	---	---
para-Isopropyltoluene	8.4E-03	8.4E-03	1.6E-11	1.6E-11	---	---	1.6E-11	1.6E-11	---	---	---	---
Tetrachloroethene	2.3E+00	1.6E-01	4.4E-09	3.1E-10	6.9E-04	4.8E-05	6.9E-04	4.8E-05	3.E-04	4.E-06	9.E-09	4.E-11
1,2,4-Trimethylbenzene	4.8E+00	2.2E-01	9.2E-09	4.2E-10	4.4E-04	2.0E-05	4.4E-04	2.0E-05	---	---	---	---
1,3,5-Trimethylbenzene	5.3E+00	2.4E-01	1.0E-08	4.6E-10	---	---	1.0E-08	4.6E-10	---	---	---	---
C9-C18 Aliphatics	4.6E+03	4.8E+02	8.8E-06	9.2E-07	2.7E-01	2.9E-02	2.7E-01	2.9E-02	7.E-02	2.E-03	---	---
C11-C22 Aromatics	8.2E+03	8.8E+02	1.6E-05	1.7E-06	1.1E-01	1.2E-02	1.1E-01	1.2E-02	1.E-01	3.E-03	---	---
Naphthalene	5.9E-01	7.1E-02	1.1E-09	1.4E-10	1.3E-05	1.6E-06	1.3E-05	1.6E-06	1.E-03	3.E-05	---	---
Benz(a)anthracene	3.7E+00	3.7E+00	7.1E-09	7.1E-09	4.0E-07	4.0E-07	4.0E-07	4.0E-07	---	---	8.E-10	6.E-11
Benzo(a)pyrene	2.0E+00	4.7E-01	3.8E-09	9.0E-10	8.1E-08	1.9E-08	8.4E-08	2.0E-08	---	---	2.E-09	3.E-11
Benzo(b)fluoranthene	1.2E+00	1.2E+00	2.3E-09	2.3E-09	2.5E-07	2.5E-07	2.5E-07	2.5E-07	---	---	5.E-10	3.E-11
Benzo(k)fluoranthene	1.7E+00	4.3E-01	3.3E-09	8.3E-10	4.2E-08	1.1E-08	4.5E-08	1.1E-08	---	---	8.E-12	2.E-13
Chrysene	2.1E+00	2.1E+00	4.0E-09	4.0E-09	7.4E-07	7.4E-07	7.4E-07	7.4E-07	---	---	1.E-11	1.E-12
Dibenzo(ah)anthracene	2.8E-01	2.8E-01	5.4E-10	5.4E-10	3.8E-09	3.8E-09	4.4E-09	4.4E-09	---	---	8.E-11	6.E-12
Indeno(123-cd)pyrene	6.6E-01	6.6E-01	1.3E-09	1.3E-09	1.1E-08	1.1E-08	1.2E-08	1.2E-08	---	---	2.E-11	2.E-12
bis(2-Ethylhexyl)phthalate	1.3E+02	2.3E+01	2.5E-07	4.4E-08	6.8E-06	1.2E-06	7.1E-06	1.2E-06	---	---	6.E-10	8.E-12
PCBs (total)	3.8E+02	3.8E+02	7.3E-07	7.3E-07	---	---	7.3E-07	7.3E-07	---	---	---	---
PCBs (minus dioxin like congeners)	3.7E+02	3.7E+02	3.7E+02	7.1E-07	---	---	7.1E-07	7.1E-07	---	---	9.E-09	3.E-10
PCB-77	3.0E+00	7.3E-01	3.0E+00	1.4E-09	---	---	5.8E-09	1.4E-09	---	---	4.E-10	7.E-12
PCB-81	9.8E-02	3.3E-02	9.8E-02	6.3E-11	---	---	1.9E-10	6.3E-11	---	---	1.E-11	3.E-13
PCB-105	4.4E+00	1.0E+00	4.4E+00	1.9E-09	---	---	8.4E-09	1.9E-09	---	---	6.E-10	1.E-11
PCB-114	4.4E-01	1.0E-01	4.4E-01	1.9E-10	---	---	8.4E-10	1.9E-10	---	---	3.E-10	5.E-12
PCB-118	7.2E+00	1.7E+00	7.2E+00	3.3E-09	---	---	1.4E-08	3.3E-09	---	---	1.E-09	2.E-11
PCB-123	7.4E-01	1.8E-01	7.4E-01	3.5E-10	---	---	1.4E-09	3.5E-10	---	---	1.E-10	2.E-12
PCB-126	2.8E-02	8.0E-03	2.8E-02	1.5E-11	---	---	5.4E-11	1.5E-11	---	---	4.E-09	8.E-11
PCB-156	2.2E-01	5.8E-02	2.2E-01	1.1E-10	---	---	4.2E-10	1.1E-10	---	---	1.E-10	3.E-12
PCB-157	5.4E-02	1.3E-02	5.4E-02	2.5E-11	---	---	1.0E-10	2.5E-11	---	---	4.E-11	6.E-13
PCB-167	4.2E-01	1.1E-01	4.2E-01	2.1E-10	---	---	8.1E-10	2.1E-10	---	---	6.E-12	1.E-13
PCB-189	8.3E-03	8.3E-03	8.3E-03	1.6E-11	---	---	1.6E-11	1.6E-11	---	---	1.E-12	8.E-14
2,3,7,8-TCDD	3.9E-07	3.0E-07	7.5E-16	5.8E-16	---	---	7.5E-16	5.8E-16	---	---	5.E-13	3.E-14
1,2,3,7,8-PeCDD	3.6E-06	1.8E-06	6.9E-15	3.5E-15	---	---	6.9E-15	3.5E-15	---	---	5.E-12	2.E-13
1,2,3,4,7,8-HxCDD	5.1E-06	2.9E-06	9.8E-15	5.6E-15	---	---	9.8E-15	5.6E-15	---	---	7.E-13	3.E-14
1,2,3,6,7,8-HxCDD	1.2E-05	7.7E-06	2.3E-14	1.5E-14	---	---	2.3E-14	1.5E-14	---	---	2.E-12	8.E-14
1,2,3,7,8,9-HxCDD	1.0E-05	5.7E-06	1.9E-14	1.1E-14	---	---	1.9E-14	1.1E-14	---	---	1.E-12	6.E-14

TABLE I-6
MODELED EPCs, HIs AND RISK ESTIMATES FOR SOIL DUST AND VAPOR PATHWAYS
Beede Waste Oil/Cash Energy Site

Chemical of Potential Concern	Soil EPC (mg/kg)		Fugitive dust EPC (mg/m^3)		Soil vapor EPC (mg/m^3)		Air (total) EPC (mg/m^3)		Chronic Total Hazard Index		Cancer Total Risk Estimates	
	RME	CT	RME	CT	RME	CT	RME	CT	RME	CT	RME	CT
1,2,3,4,6,7,8-HpCDD	2.5E-04	1.3E-04	4.8E-13	2.5E-13	---	---	4.8E-13	2.5E-13	---	---	3.E-12	1.E-13
OCDD	2.0E-03	1.0E-03	3.8E-12	1.9E-12	---	---	3.8E-12	1.9E-12	---	---	3.E-13	1.E-14
2,3,7,8-TCDF	5.9E-05	2.0E-05	1.1E-13	3.8E-14	---	---	1.1E-13	3.8E-14	---	---	8.E-12	2.E-13
1,2,3,7,8-PeCDF	2.2E-05	7.7E-06	4.2E-14	1.5E-14	---	---	4.2E-14	1.5E-14	---	---	1.E-12	4.E-14
2,3,4,7,8-PeCDF	1.4E-04	5.5E-05	2.7E-13	1.1E-13	---	---	2.7E-13	1.1E-13	---	---	9.E-11	3.E-12
1,2,3,4,7,8-HxCDF	3.2E-05	1.5E-05	6.1E-14	2.9E-14	---	---	6.1E-14	2.9E-14	---	---	4.E-12	1.E-13
1,2,3,6,7,8-HxCDF	1.9E-05	8.8E-06	3.6E-14	1.7E-14	---	---	3.6E-14	1.7E-14	---	---	3.E-12	9.E-14
1,2,3,7,8,9-HxCDF	1.1E-05	4.3E-06	2.1E-14	8.3E-15	---	---	2.1E-14	8.3E-15	---	---	1.E-12	4.E-14
2,3,4,6,7,8-HxCDF	2.1E-05	1.0E-05	4.0E-14	1.9E-14	---	---	4.0E-14	1.9E-14	---	---	3.E-12	1.E-13
1,2,3,4,6,7,8-HpCDF	6.3E-05	3.4E-05	1.2E-13	6.5E-14	---	---	1.2E-13	6.5E-14	---	---	9.E-13	3.E-14
1,2,3,4,7,8,9-HpCDF	7.8E-06	3.8E-06	1.5E-14	7.3E-15	---	---	1.5E-14	7.3E-15	---	---	1.E-13	4.E-15
OCDF	1.0E-04	5.2E-05	1.9E-13	1.0E-13	---	---	1.9E-13	1.0E-13	---	---	1.E-14	5.E-16
Antimony	6.2E-01	6.2E-01	1.2E-09	1.2E-09	---	---	1.2E-09	1.2E-09	1.E-06	3.E-07	---	---
Arsenic	7.0E+00	7.0E+00	1.3E-08	1.3E-08	---	---	1.3E-08	1.3E-08	---	---	1.E-09	9.E-11
Barium	3.2E+03	1.4E+02	6.1E-06	2.7E-07	---	---	6.1E-06	2.7E-07	3.E-03	3.E-05	---	---
Beryllium	3.6E-01	3.6E-01	6.9E-10	6.9E-10	---	---	6.9E-10	6.9E-10	9.E-06	2.E-06	4.E-11	3.E-12
Cadmium (Food)	2.3E+01	1.1E+00	4.4E-08	2.1E-09	---	---	4.4E-08	2.1E-09	---	---	2.E-09	6.E-12
Chromium VI (particulates)	5.3E+02	3.1E+01	1.0E-06	6.0E-08	---	---	1.0E-06	6.0E-08	3.E-03	3.E-05	3.E-07	1.E-09
Copper	2.1E+01	2.1E+01	4.0E-08	4.0E-08	---	---	4.0E-08	4.0E-08	---	---	---	---
Lead	9.0E+02	9.0E+02	1.7E-06	1.7E-06	---	---	1.7E-06	1.7E-06	---	---	---	---
Manganese	2.6E+02	1.1E+02	5.0E-07	2.1E-07	---	---	5.0E-07	2.1E-07	2.E-03	2.E-04	---	---
Mercury	3.0E-01	3.0E-01	5.8E-10	5.8E-10	---	---	5.8E-10	5.8E-10	5.E-07	1.E-07	---	---
Molybdenum	3.6E+00	3.6E+00	6.9E-09	6.9E-09	---	---	6.9E-09	6.9E-09	---	---	---	---
Nickel	9.2E+02	3.8E+01	1.8E-06	7.3E-08	---	---	1.8E-06	7.3E-08	---	---	---	---
Vanadium	1.6E+01	1.6E+01	3.1E-08	3.1E-08	---	---	3.1E-08	3.1E-08	---	---	---	---
Zinc	1.6E+03	1.0E+02	3.1E-06	1.9E-07	---	---	3.1E-06	1.9E-07	---	---	---	---

(1) Total Hazard Index or Cancer Risk Across Air Exposure Routes	2.E-01	5.E-03	3.E-07	2.E-09
(2) Total Hazard Index or Cancer Risk Across All Media and All Exposure Routes	4.E+02	8.E+01	3.E-02	2.E-04

(1) The "Total Hazard Index or Cancer Risk Across Air Exposure Routes" is the HI or risk for the modeled soil dust and vapor inhalation pathways.
(2) The "Total Hazard Index or Cancer Risk Across All Media and All Exposure Routes" is the HI or risk for the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.

TABLE I-7
MODELED EPCs, HIs AND RISK ESTIMATES FOR SOIL DUST AND VAPOR PATHWAYS
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current
Medium: Soil
Exposure Medium: Surface Soil (0 to 1 foot)
Exposure Point: Fugitive dust and vapors
Receptor Population: Trespasser
Receptor Age: Child

Chemical of Potential Concern	Soil EPC (mg/kg)		Fugitive dust EPC (mg/m^3)		Soil vapor EPC (mg/m^3)		Air (total) EPC (mg/m^3)		Chronic Total Hazard Index		Cancer Total Risk Estimates	
	RME	CT	RME	CT	RME	CT	RME	CT	RME	CT	RME	CT
1,2-Dichloroethene (cis)	4.0E-03	4.0E-03	7.7E-12	7.7E-12	1.3E-06	1.3E-06	1.3E-06	1.3E-06	---	---	---	---
para-Isopropyltoluene	8.4E-03	8.4E-03	1.6E-11	1.6E-11	---	---	1.6E-11	1.6E-11	---	---	---	---
Tetrachloroethene	2.3E+00	1.6E-01	4.4E-09	3.1E-10	6.9E-04	4.8E-05	6.9E-04	4.8E-05	3.E-05	8.E-07	2.E-09	5.E-11
1,2,4-Trimethylbenzene	4.8E+00	2.2E-01	9.2E-09	4.2E-10	4.4E-04	2.0E-05	4.4E-04	2.0E-05	---	---	---	---
1,3,5-Trimethylbenzene	5.3E+00	2.4E-01	1.0E-08	4.6E-10	---	---	1.0E-08	4.6E-10	---	---	---	---
C9-C18 Aliphatics	4.6E+03	4.8E+02	8.8E-06	9.2E-07	2.7E-01	2.9E-02	2.7E-01	2.9E-02	7.E-03	3.E-04	---	---
C11-C22 Aromatics	8.2E+03	8.8E+02	1.6E-05	1.7E-06	1.1E-01	1.2E-02	1.1E-01	1.2E-02	1.E-02	6.E-04	---	---
Naphthalene	5.9E-01	7.1E-02	1.1E-09	1.4E-10	1.3E-05	1.6E-06	1.3E-05	1.6E-06	1.E-04	5.E-06	---	---
Benz(a)anthracene	3.7E+00	3.7E+00	7.1E-09	7.1E-09	4.0E-07	4.0E-07	4.0E-07	4.0E-07	---	---	2.E-10	6.E-11
Benzo(a)pyrene	2.0E+00	4.7E-01	3.8E-09	9.0E-10	8.1E-08	1.9E-08	8.4E-08	2.0E-08	---	---	3.E-10	3.E-11
Benzo(b)fluoranthene	1.2E+00	1.2E+00	2.3E-09	2.3E-09	2.5E-07	2.5E-07	2.5E-07	2.5E-07	---	---	1.E-10	4.E-11
Benzo(k)fluoranthene	1.7E+00	4.3E-01	3.3E-09	8.3E-10	4.2E-08	1.1E-08	4.5E-08	1.1E-08	---	---	2.E-12	2.E-13
Chrysene	2.1E+00	2.1E+00	4.0E-09	4.0E-09	7.4E-07	7.4E-07	7.4E-07	7.4E-07	---	---	3.E-12	1.E-12
Dibenzo(ah)anthracene	2.8E-01	2.8E-01	5.4E-10	5.4E-10	3.8E-09	3.8E-09	4.4E-09	4.4E-09	---	---	2.E-11	7.E-12
Indeno(123-cd)pyrene	6.6E-01	6.6E-01	1.3E-09	1.3E-09	1.1E-08	1.1E-08	1.2E-08	1.2E-08	---	---	5.E-12	2.E-12
bis(2-Ethylhexyl)phthalate	1.3E+02	2.3E+01	2.5E-07	4.4E-08	6.8E-06	1.2E-06	7.1E-06	1.2E-06	---	---	1.E-10	9.E-12
PCBs (total)	3.8E+02	3.8E+02	7.3E-07	7.3E-07	---	---	7.3E-07	7.3E-07	---	---	---	---
PCBs (minus dioxin like congeners)	3.7E+02	3.7E+02	7.0E-07	7.1E-07	---	---	7.1E-07	7.1E-07	---	---	2.E-09	4.E-10
PCB-77	3.0E+00	7.3E-01	5.76E-09	1.4E-09	---	---	5.8E-09	1.4E-09	---	---	8.E-11	8.E-12
PCB-81	9.8E-02	3.3E-02	1.88E-10	6.3E-11	---	---	1.9E-10	6.3E-11	---	---	3.E-12	4.E-13
PCB-105	4.4E+00	1.0E+00	8.45E-09	1.9E-09	---	---	8.4E-09	1.9E-09	---	---	1.E-10	1.E-11
PCB-114	4.4E-01	1.0E-01	8.45E-10	1.9E-10	---	---	8.4E-10	1.9E-10	---	---	6.E-11	6.E-12
PCB-118	7.2E+00	1.7E+00	1.38E-08	3.3E-09	---	---	1.4E-08	3.3E-09	---	---	2.E-10	2.E-11
PCB-123	7.4E-01	1.8E-01	1.42E-09	3.5E-10	---	---	1.4E-09	3.5E-10	---	---	2.E-11	2.E-12
PCB-126	2.8E-02	8.0E-03	5.38E-11	1.5E-11	---	---	5.4E-11	1.5E-11	---	---	8.E-10	9.E-11
PCB-156	2.2E-01	5.8E-02	4.22E-10	1.1E-10	---	---	4.2E-10	1.1E-10	---	---	3.E-11	3.E-12
PCB-157	5.4E-02	1.3E-02	1.04E-10	2.5E-11	---	---	1.0E-10	2.5E-11	---	---	8.E-12	7.E-13
PCB-167	4.2E-01	1.1E-01	8.06E-10	2.1E-10	---	---	8.1E-10	2.1E-10	---	---	1.E-12	1.E-13
PCB-189	8.3E-03	8.3E-03	1.6E-11	1.6E-11	---	---	1.6E-11	1.6E-11	---	---	2.E-13	9.E-14
2,3,7,8-TCDD	3.9E-07	3.0E-07	7.5E-16	5.8E-16	---	---	7.5E-16	5.8E-16	---	---	1.E-13	3.E-14
1,2,3,7,8-PeCDD	3.6E-06	1.8E-06	6.9E-15	3.5E-15	---	---	6.9E-15	3.5E-15	---	---	1.E-12	2.E-13
1,2,3,4,7,8-HxCDD	5.1E-06	2.9E-06	9.8E-15	5.6E-15	---	---	9.8E-15	5.6E-15	---	---	1.E-13	3.E-14
1,2,3,6,7,8-HxCDD	1.2E-05	7.7E-06	2.3E-14	1.5E-14	---	---	2.3E-14	1.5E-14	---	---	3.E-13	9.E-14
1,2,3,7,8,9-HxCDD	1.0E-05	5.7E-06	1.9E-14	1.1E-14	---	---	1.9E-14	1.1E-14	---	---	3.E-13	6.E-14

TABLE I-7
MODELED EPCs, HIs AND RISK ESTIMATES FOR SOIL DUST AND VAPOR PATHWAYS
Beede Waste Oil/Cash Energy Site

Chemical of Potential Concern	Soil EPC (mg/kg)		Fugitive dust EPC (mg/m^3)		Soil vapor EPC (mg/m^3)		Air (total) EPC (mg/m^3)		Chronic Total Hazard Index		Cancer Total Risk Estimates	
	RME	CT	RME	CT	RME	CT	RME	CT	RME	CT	RME	CT
1,2,3,4,6,7,8-HpCDD	2.5E-04	1.3E-04	4.8E-13	2.5E-13	---	---	4.8E-13	2.5E-13	---	---	7.E-13	1.E-13
OCDD	2.0E-03	1.0E-03	3.8E-12	1.9E-12	---	---	3.8E-12	1.9E-12	---	---	6.E-14	1.E-14
2,3,7,8-TCDF	5.9E-05	2.0E-05	1.1E-13	3.8E-14	---	---	1.1E-13	3.8E-14	---	---	2.E-12	2.E-13
1,2,3,7,8-PeCDF	2.2E-05	7.7E-06	4.2E-14	1.5E-14	---	---	4.2E-14	1.5E-14	---	---	3.E-13	4.E-14
2,3,4,7,8-PeCDF	1.4E-04	5.5E-05	2.7E-13	1.1E-13	---	---	2.7E-13	1.1E-13	---	---	2.E-11	3.E-12
1,2,3,4,7,8-HxCDF	3.2E-05	1.5E-05	6.1E-14	2.9E-14	---	---	6.1E-14	2.9E-14	---	---	9.E-13	2.E-13
1,2,3,6,7,8-HxCDF	1.9E-05	8.8E-06	3.6E-14	1.7E-14	---	---	3.6E-14	1.7E-14	---	---	5.E-13	1.E-13
1,2,3,7,8,9-HxCDF	1.1E-05	4.3E-06	2.1E-14	8.3E-15	---	---	2.1E-14	8.3E-15	---	---	3.E-13	5.E-14
2,3,4,6,7,8-HxCDF	2.1E-05	1.0E-05	4.0E-14	1.9E-14	---	---	4.0E-14	1.9E-14	---	---	6.E-13	1.E-13
1,2,3,4,6,7,8-HpCDF	6.3E-05	3.4E-05	1.2E-13	6.5E-14	---	---	1.2E-13	6.5E-14	---	---	2.E-13	4.E-14
1,2,3,4,7,8,9-HpCDF	7.8E-06	3.8E-06	1.5E-14	7.3E-15	---	---	1.5E-14	7.3E-15	---	---	2.E-14	4.E-15
OCDF	1.0E-04	5.2E-05	1.9E-13	1.0E-13	---	---	1.9E-13	1.0E-13	---	---	3.E-15	6.E-16
Antimony	6.2E-01	6.2E-01	1.2E-09	1.2E-09	---	---	1.2E-09	1.2E-09	2.E-07	6.E-08	---	---
Arsenic	7.0E+00	7.0E+00	1.3E-08	1.3E-08	---	---	1.3E-08	1.3E-08	---	---	3.E-10	1.E-10
Barium	3.2E+03	1.4E+02	6.1E-06	2.7E-07	---	---	6.1E-06	2.7E-07	3.E-04	6.E-06	---	---
Beryllium	3.6E-01	3.6E-01	6.9E-10	6.9E-10	---	---	6.9E-10	6.9E-10	9.E-07	4.E-07	7.E-12	3.E-12
Cadmium (Food)	2.3E+01	1.1E+00	4.4E-08	2.1E-09	---	---	4.4E-08	2.1E-09	---	---	4.E-10	7.E-12
Chromium VI (particulates)	5.3E+02	3.1E+01	1.0E-06	6.0E-08	---	---	1.0E-06	6.0E-08	3.E-04	6.E-06	5.E-08	1.E-09
Copper	2.1E+01	2.1E+01	4.0E-08	4.0E-08	---	---	4.0E-08	4.0E-08	---	---	---	---
Lead	9.0E+02	9.0E+02	1.7E-06	1.7E-06	---	---	1.7E-06	1.7E-06	---	---	---	---
Manganese	2.6E+02	1.1E+02	5.0E-07	2.1E-07	---	---	5.0E-07	2.1E-07	3.E-04	4.E-05	---	---
Mercury	3.0E-01	3.0E-01	5.8E-10	5.8E-10	---	---	5.8E-10	5.8E-10	5.E-08	2.E-08	---	---
Molybdenum	3.6E+00	3.6E+00	6.9E-09	6.9E-09	---	---	6.9E-09	6.9E-09	---	---	---	---
Nickel	9.2E+02	3.8E+01	1.8E-06	7.3E-08	---	---	1.8E-06	7.3E-08	---	---	---	---
Vanadium	1.6E+01	1.6E+01	3.1E-08	3.1E-08	---	---	3.1E-08	3.1E-08	---	---	---	---
Zinc	1.6E+03	1.0E+02	3.1E-06	1.9E-07	---	---	3.1E-06	1.9E-07	---	---	---	---

(1) Total Hazard Index or Cancer Risk Across Air Exposure Routes	2.E-02	1.E-03	6.E-08	2.E-09
(2) Total Hazard Index or Cancer Risk Across All Media and All Exposure Routes	2.E+01	3.E+00	2.E-04	1.E-05

(1) The "Total Hazard Index or Cancer Risk Across Air Exposure Routes" is the HI or risk for the modeled soil dust and vapor inhalation pathways.
(2) The "Total Hazard Index or Cancer Risk Across All Media and All Exposure Routes" is the HI or risk for the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.

TABLE I-8
MODELED EPCs, HIs AND RISK ESTIMATES FOR SOIL DUST AND VAPOR PATHWAYS
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Surface and Subsurface Soil (0 to 10 feet)
Exposure Point: Fugitive dust and vapors
Receptor Population: Construction Worker
Receptor Age: Adult

Chemical of Potential Concern	Soil EPC (mg/kg)		Fugitive dust EPC (mg/m^3)		Soil vapor EPC (mg/m^3)		Air (total) EPC (mg/m^3)		Subchronic Total Hazard Index		Cancer Total Risk Estimates	
	RME	CT	RME	CT	RME	CT	RME	CT	RME	CT	RME	CT
sec-Butylbenzene	1.8E-01	1.8E-01	3.5E-10	3.5E-10	---	---	3.5E-10	3.5E-10	---	---	---	---
1,2-Dichloroethene (cis)	1.1E+01	1.8E-01	2.1E-08	3.5E-10	3.6E-03	5.9E-05	3.6E-03	5.9E-05	---	---	---	---
para-Isopropyltoluene	1.9E-01	1.9E-01	3.6E-10	3.6E-10	---	---	3.6E-10	3.6E-10	---	---	---	---
n-Propylbenzene	2.1E-01	2.1E-01	4.0E-10	4.0E-10	---	---	4.0E-10	4.0E-10	---	---	---	---
Tetrachloroethene	1.3E-01	1.3E-01	2.5E-10	2.5E-10	3.9E-05	3.9E-05	3.9E-05	3.9E-05	5.E-05	8.E-06	3.E-10	4.E-11
1,2,4-Trimethylbenzene	2.8E+00	2.8E+00	5.4E-09	5.4E-09	2.6E-04	2.6E-04	2.6E-04	2.6E-04	---	---	---	---
1,3,5-Trimethylbenzene	7.4E-01	7.4E-01	1.4E-09	1.4E-09	---	---	1.4E-09	1.4E-09	---	---	---	---
C9-C18 Aliphatics	1.1E+03	1.1E+03	2.1E-06	2.1E-06	6.6E-02	6.6E-02	6.6E-02	6.6E-02	5.E-02	8.E-03	---	---
C11-C22 Aromatics	6.6E+02	6.6E+02	1.3E-06	1.3E-06	8.9E-03	8.9E-03	8.9E-03	8.9E-03	4.E-02	6.E-03	---	---
Naphthalene	8.0E-01	8.0E-01	1.5E-09	1.5E-09	1.8E-05	1.8E-05	1.8E-05	1.8E-05	5.E-03	8.E-04	---	---
Benz(a)anthracene	8.8E-01	8.8E-01	1.7E-09	1.7E-09	9.4E-08	9.4E-08	9.6E-08	9.6E-08	---	---	1.E-10	2.E-11
Benzo(a)pyrene	2.0E+00	3.7E-01	3.8E-09	7.1E-10	8.1E-08	1.5E-08	8.4E-08	1.6E-08	---	---	9.E-10	3.E-11
Benzo(b)fluoranthene	5.4E-01	5.4E-01	1.0E-09	1.0E-09	1.1E-07	1.1E-07	1.1E-07	1.1E-07	---	---	1.E-10	2.E-11
Benzo(k)fluoranthene	1.7E+00	3.3E-01	3.3E-09	6.3E-10	4.2E-08	8.1E-09	4.5E-08	8.7E-09	---	---	5.E-12	1.E-13
Chrysene	7.5E-01	7.5E-01	1.4E-09	1.4E-09	2.6E-07	2.6E-07	2.6E-07	2.6E-07	---	---	3.E-12	4.E-13
Dibenzo(ah)anthracene	2.2E-01	2.2E-01	4.2E-10	4.2E-10	3.0E-09	3.0E-09	3.4E-09	3.4E-09	---	---	4.E-11	6.E-12
Indeno(123-cd)pyrene	3.6E-01	3.6E-01	6.9E-10	6.9E-10	6.1E-09	6.1E-09	6.8E-09	6.8E-09	---	---	7.E-12	1.E-12
bis(2-Ethylhexyl)phthalate	3.4E+01	3.4E+01	6.5E-08	6.5E-08	1.8E-06	1.8E-06	1.8E-06	1.8E-06	2.E-04	2.E-05	9.E-11	1.E-11
PCBs (total)	9.8E+01	9.8E+01	1.9E-07	1.9E-07	---	---	1.9E-07	1.9E-07	---	---	---	---
PCBs (minus dioxin like congeners)	8.0E+01	8.0E+01	1.5E-07	1.5E-07	---	---	1.5E-07	1.5E-07	---	---	1.E-09	8.E-11
PCB-77	3.0E+00	2.8E-01	5.8E-09	5.4E-10	---	---	5.8E-09	5.4E-10	---	---	2.E-10	3.E-12
PCB-81	5.3E-02	5.3E-02	1.0E-10	1.0E-10	---	---	1.0E-10	1.0E-10	---	---	4.E-12	6.E-13
PCB-105	2.2E+00	2.2E+00	4.2E-09	4.2E-09	---	---	4.2E-09	4.2E-09	---	---	2.E-10	3.E-11
PCB-114	1.4E-01	1.4E-01	2.7E-10	2.7E-10	---	---	2.7E-10	2.7E-10	---	---	5.E-11	8.E-12
PCB-118	3.3E+00	3.3E+00	6.3E-09	6.3E-09	---	---	6.3E-09	6.3E-09	---	---	2.E-10	4.E-11
PCB-123	1.8E-01	1.8E-01	3.5E-10	3.5E-10	---	---	3.5E-10	3.5E-10	---	---	1.E-11	2.E-12
PCB-126	7.6E-03	7.6E-03	1.5E-11	1.5E-11	---	---	1.5E-11	1.5E-11	---	---	6.E-10	9.E-11
PCB-156	5.0E-02	5.0E-02	9.6E-11	9.6E-11	---	---	9.6E-11	9.6E-11	---	---	2.E-11	3.E-12
PCB-157	1.1E-02	1.1E-02	2.1E-11	2.1E-11	---	---	2.1E-11	2.1E-11	---	---	4.E-12	6.E-13
PCB-167	8.7E-02	8.7E-02	1.7E-10	1.7E-10	---	---	1.7E-10	1.7E-10	---	---	6.E-13	1.E-13
PCB-189	3.0E-03	3.0E-03	5.8E-12	5.8E-12	---	---	5.8E-12	5.8E-12	---	---	2.E-13	3.E-14
2,3,7,8-TCDD	3.9E-07	3.0E-07	7.5E-16	5.8E-16	---	---	7.5E-16	5.8E-16	---	---	3.E-13	3.E-14
1,2,3,7,8-PeCDD	3.6E-06	1.8E-06	6.9E-15	3.5E-15	---	---	6.9E-15	3.5E-15	---	---	3.E-12	2.E-13
1,2,3,4,7,8-HxCDD	5.1E-06	2.9E-06	9.8E-15	5.6E-15	---	---	9.8E-15	5.6E-15	---	---	4.E-13	3.E-14
1,2,3,6,7,8-HxCDD	1.2E-05	7.7E-06	2.3E-14	1.5E-14	---	---	2.3E-14	1.5E-14	---	---	9.E-13	9.E-14

TABLE I-8
MODELED EPCs, HIs AND RISK ESTIMATES FOR SOIL DUST AND VAPOR PATHWAYS
Beede Waste Oil/Cash Energy Site

Chemical of Potential Concern	Soil EPC (mg/kg)		Fugitive dust EPC (mg/m^3)		Soil vapor EPC (mg/m^3)		Air (total) EPC (mg/m^3)		Subchronic Total Hazard Index		Cancer Total Risk Estimates	
	RME	CT	RME	CT	RME	CT	RME	CT	RME	CT	RME	CT
1,2,3,7,8,9-HxCDD	1.0E-05	5.7E-06	1.9E-14	1.1E-14	---	---	1.9E-14	1.1E-14	---	---	7.E-13	7.E-14
1,2,3,4,6,7,8-HpCDD	2.5E-04	1.3E-04	4.8E-13	2.5E-13	---	---	4.8E-13	2.5E-13	---	---	2.E-12	2.E-13
OCDD	2.0E-03	1.0E-03	3.8E-12	1.9E-12	---	---	3.8E-12	1.9E-12	---	---	1.E-13	1.E-14
2,3,7,8-TCDF	5.9E-05	2.0E-05	1.1E-13	3.8E-14	---	---	1.1E-13	3.8E-14	---	---	4.E-12	2.E-13
1,2,3,7,8-PeCDF	2.2E-05	7.7E-06	4.2E-14	1.5E-14	---	---	4.2E-14	1.5E-14	---	---	8.E-13	4.E-14
2,3,4,7,8-PeCDF	1.4E-04	5.5E-05	2.7E-13	1.1E-13	---	---	2.7E-13	1.1E-13	---	---	5.E-11	3.E-12
1,2,3,4,7,8-HxCDF	3.2E-05	1.5E-05	6.1E-14	2.9E-14	---	---	6.1E-14	2.9E-14	---	---	2.E-12	2.E-13
1,2,3,6,7,8-HxCDF	1.9E-05	8.8E-06	3.6E-14	1.7E-14	---	---	3.6E-14	1.7E-14	---	---	1.E-12	1.E-13
1,2,3,7,8,9-HxCDF	1.1E-05	4.3E-06	2.1E-14	8.3E-15	---	---	2.1E-14	8.3E-15	---	---	8.E-13	5.E-14
2,3,4,6,7,8-HxCDF	2.1E-05	1.0E-05	4.0E-14	1.9E-14	---	---	4.0E-14	1.9E-14	---	---	2.E-12	1.E-13
1,2,3,4,6,7,8-HpCDF	6.3E-05	3.4E-05	1.2E-13	6.5E-14	---	---	1.2E-13	6.5E-14	---	---	5.E-13	4.E-14
1,2,3,4,7,8,9-HpCDF	7.8E-06	3.8E-06	1.5E-14	7.3E-15	---	---	1.5E-14	7.3E-15	---	---	6.E-14	4.E-15
OCDF	1.0E-04	5.2E-05	1.9E-13	1.0E-13	---	---	1.9E-13	1.0E-13	---	---	7.E-15	6.E-16
Antimony	7.4E-01	7.4E-01	1.4E-09	1.4E-09	---	---	1.4E-09	1.4E-09	6.E-06	9.E-07	---	---
Arsenic	6.6E+00	6.6E+00	1.3E-08	1.3E-08	---	---	1.3E-08	1.3E-08	---	---	6.E-10	1.E-10
Barium	7.8E+01	7.8E+01	1.5E-07	1.5E-07	---	---	1.5E-07	1.5E-07	2.E-05	4.E-06	---	---
Beryllium	1.8E+00	4.0E-01	3.5E-09	7.7E-10	---	---	3.5E-09	7.7E-10	1.E-04	5.E-06	1.E-10	3.E-12
Cadmium (Food)	4.4E+01	1.3E+00	8.4E-08	2.5E-09	---	---	8.4E-08	2.5E-09	---	---	2.E-09	8.E-12
Chromium VI (particulates)	5.3E+02	2.6E+01	1.0E-06	5.0E-08	---	---	1.0E-06	5.0E-08	8.E-03	6.E-05	1.E-07	1.E-09
Lead	4.9E+02	4.9E+02	9.4E-07	9.4E-07	---	---	9.4E-07	9.4E-07	---	---	---	---
Mercury	2.4E+01	6.1E+00	4.6E-08	1.2E-08	---	---	4.6E-08	1.2E-08	1.E-04	5.E-06	---	---
Nickel	9.2E+02	2.3E+01	1.8E-06	4.4E-08	---	---	1.8E-06	4.4E-08	---	---	---	---
Zinc	1.3E+02	1.3E+02	2.5E-07	2.5E-07	---	---	2.5E-07	2.5E-07	---	---	---	---

(1) Total Hazard Index or Cancer Risk Across Air Exposure Routes	1.E-01	1.E-02	1.E-07	2.E-09
(2) Total Hazard Index or Cancer Risk Across All Media and All Exposure Routes	5.E+01	1.E+01	2.E-04	2E-05

(1) The "Total Hazard Index or Cancer Risk Across Air Exposure Routes" is the HI or risk for the modeled soil dust and vapor inhalation pathways.
(2) The "Total Hazard Index or Cancer Risk Across All Media and All Exposure Routes" is the HI or risk for the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.

APPENDIX J

RAGS PART D TABLE 4 SERIES:

VALUES USED FOR DAILY INTAKE CALCULATIONS AND SUPPORTING INFORMATION

TABLE 4.1

VALUES USED FOR DAILY INTAKE CALCULATIONS

Beede Waste Oil

Scenario Timeframe: Current/Future
Medium: Sediment
Medium Description: Kelley Brook
Exposure Medium: Sediment
Exposure Point: Kelley Brook and Adjacent Wetlands
Receptor Population: Other Recreational Person
Receptor Age: Child[+]

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CS	Chemical Concentration in Sediment	mg/kg	See Table 3	(3)	See Table 3	(3)	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR-S	Ingestion Rate of Sediment	mg/day	100	EPA, 1994	50	EPA, 1994	CS x IR x CF1 x FI x EF x ED x
	CF1	Conversion Factor	kg/mg	10^{-6}	- -	10^{-6}	- -	1/BW x 1/AT
	FI	Fraction Ingested	unitless	1	(2)	1	(2)	
	EF	Exposure Frequency	days/yr	110	Five (5) non-winter months and five (5) days/week; EPA, 1994	44	Five (5) non-winter months and two (2) days per week; (2)	
	ED	Exposure Duration	yrs	12	EPA, 1989	12	EPA, 1989	
	BW	Body Weight	kg	45	EPA, 1997 (Vol I: Table 7-3)	45	EPA, 1997 (Vol I: Table 7-3)	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	4,380	EPA, 1989	4,380	EPA, 1989	

TABLE 4.1

VALUES USED FOR DAILY INTAKE CALCULATIONS

Beede Waste Oil

Scenario Timeframe: Current/Future
Medium: Sediment
Medium Description: Kelley Brook
Exposure Medium: Sediment
Exposure Point: Kelley Brook and Adjacent Wetlands
Receptor Population: Other Recreational Person
Receptor Age: Child+

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Dermal	CS	Chemical Concentration in Sediment	mg/kg	See Table 3	(3)	See Table 3	(3)	Chronic Absorbed Dose (CAD) (mg/kg-day) =
	CF1	Conversion Factor 1	kg/mg	10^{-6}	- -	10^{-6}	- -	CS x CF1 x SA x AF x ABS x EF x ED x
	SA	Skin Surface Area Available for Contact	cm^2/event	7,762	50th percentile skin exposure for: head, hands, arms, and legs; age 6-18yrs; EPA, 1997 Vol. 1 (Table 6-6 thru Table 6-8)	7,762	50th percentile skin exposure for: head, hands, arms, and legs; age 6-18yrs; EPA, 1997 Vol. 1 (Table 6-6 thru Table 6-8)	1/BW x 1/AT
	AF	Soil to Skin Adherence Factor	mg/cm^2	0.66	Adult women reed-gatherers, 2hrs. Of hand contact; Kissel, 1996	0.66	Adult women reed-gatherers, 2hrs. Of hand contact; Kissel, 1996	
	ABS	Absorption Factor	unitless	(1)	(1)	(1)	(1)	
	EF	Exposure Frequency	events/yr	110	Five (5) non-winter months and five (5) days/week; EPA, 1994	44	Five (5) non-winter months and two (2) days per week; (2)	
	ED	Exposure Duration	yrs	12	EPA, 1989	12	EPA, 1989	
	BW	Body Weight	kg	45	EPA, 1997 (Vol I: Table 7-3)	45	EPA, 1997 (Vol I: Table 7-3)	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	4,380	EPA, 1989	4,380	EPA, 1989	

(1) Refer to Table 4A - Dermal Absorption Efficiencies (PC and ABS)

(2) Professional Judgement

(3) Table 3.1 presents the COPC exposure point concentrations

+ The other recreational person - child is 7-18 years old

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part A. OERR. EPA/540/189/002.

EPA, 1994: USEPA Region 1, Waste Management Division, Risk Updates. August 1994, Number 2, Attachment 2 and Attachment 3.

EPA, 1997: Exposure Factors Handbook, Volume I, Volume II, and Volume III. ORD. EPA/600/P-95/002Fc.

Kissel, et al. 1996: Field Measurement of Dermal Loading Attributable to Various Activities: Implications for Exposure Assessment. Risk Analysis. 16(1):115-125.

TABLE 4.2

VALUES USED FOR DAILY INTAKE CALCULATIONS

Beede Waste Oil

Scenario Timeframe: Current/Future
Medium: Sediment
Medium Description: Kelley Brook
Exposure Medium: Sediment
Exposure Point: Kelley Brook and Adjacent Wetland
Receptor Population: Fisher
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CS	Chemical Concentration in Sediment	mg/kg	See Table 3	(3)	See Table 3	(3)	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR-S	Ingestion Rate of Sediment	mg/day	100	EPA, 1994	50	EPA, 1994	CS x IR x CF1 x FI x EF x ED x
	CF1	Conversion Factor	kg/mg	10^{-6}	- -	10^{-6}		1/BW x 1/AT
	FI	Fraction Ingested	unitless	1	(2)	1	(2)	
	EF	Exposure Frequency	days/yr	64	Five (5) non-winter months and three (3) days per week; (2)	22	Five (5) non-winter months and one (1) day per week; (2)	
	ED	Exposure Duration	yrs	24	EPA, 1994	7	EPA, 1994	
	BW	Body Weight	kg	70	EPA, 1994	70	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	8,760	EPA, 1989	2,555	EPA, 1989	

TABLE 4.2

VALUES USED FOR DAILY INTAKE CALCULATIONS

Beede Waste Oil

Scenario Timeframe: Current/Future
Medium: Sediment
Medium Description: Kelley Brook
Exposure Medium: Sediment
Exposure Point: Kelley Brook and Adjacent Wetland
Receptor Population: Fisher
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Dermal	CS	Chemical Concentration in Sediment	mg/kg	See Table 3	(3)	See Table 3	(3)	Chronic Absorbed Dose (CAD) (mg/kg-day) =
	CF1	Conversion Factor 1	kg/mg	10^{-6}	- -	10^{-6}	- -	CS x CF1 x SA x AF x ABS x EF x ED x 1/BW x 1/AT
	SA	Skin Surface Area Available for Contact	cm^2/event	4,601	Central tendency skin exposure for: head, hands, forearms, feet; EPA, 1997 Vol. 1 (Table 6-2 thru Table 6-5)	4,601	Central tendency skin exposure for: head, hands, forearms, feet; EPA, 1997 Vol. 1 (Table 6-2 thru Table 6-5)	
	AF	Soil to Skin Adherence Factor	mg/cm^2	0.66	Adult women reed-gatherers, 2hrs. Of hand contact; Kissel, 1996	0.66	Adult women reed-gatherers, 2hrs. Of hand contact; Kissel, 1996	
	ABS	Absorption Factor	unitless	(1)	(1)	(1)	(1)	
	EF	Exposure Frequency	events/yr	64	Five (5) non-winter months and three (3) days per week; (2)	22	Five (5) non-winter months and one (1) day per week; (2)	
	ED	Exposure Duration	yrs	24	EPA, 1994	7	EPA, 1994	
	BW	Body Weight	kg	70	EPA, 1994	70	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	8,760	EPA, 1989	2,555	EPA, 1989	

(1) Refer to Table 4A - Dermal Absorption Efficiencies (PC and ABS)

(2) Professional Judgement

(3) Table 3.1 presents the COPC exposure point concentrations

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part A. OERR. EPA/540/189/002.

EPA, 1994: USEPA Region 1, Waste Management Division, Risk Updates. August 1994, Number 2, Attachment 2 and Attachment 3.

EPA, 1997: Exposure Factors Handbook, Volume I, Volume II, and Volume III. ORD. EPA/600/P-95/002Fc.

Kissel, et al. 1996: Field Measurement of Dermal Loading Attributable to Various Activities: Implications for Exposure Assessment. Risk Analysis. 16(1):115-125.

TABLE 4.3

VALUES USED FOR DAILY INTAKE CALCULATIONS

Beede Waste Oil

Scenario Timeframe: Current/Future
Medium: Surface Water
Medium Description: Kelley Brook
Exposure Medium: Surface Water
Exposure Point: Kelley Brook and Adjacent Wetlands
Receptor Population: Other Recreational Person
Receptor Age: Child+

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CW	Chemical Concentration in Water	µg/L	See Table 3	(3)	See Table 3	(3)	Chronic Daily Intake (CDI) (mg/kg-day) = CW x IR x EF x ED x CF1 x 1/BW x 1/AT
	IR-W	Ingestion Rate of Water	L/day	0.05	From EPA 1989, incidental ingestion = 50mL/hr; 1hour/day (2)	0.05	From EPA 1989, incidental ingestion = 50mL/hr; 1hour/day (2)	
	EF	Exposure Frequency	days/yr	110	Five (5) non-winter months and five (5) days per week; EPA, 1994	44	Five (5) non-winter months and two (2) days per week; (2)	
	ED	Exposure Duration	yrs	12	EPA, 1989	12	EPA, 1989	
	CF1	Conversion Factor 1	mg/µg	0.001	- -	0.001	- -	
	BW	Body Weight	kg	45	EPA, 1997 (Vol I: Table 7-3)	45	EPA, 1997 (Vol I: Table 7-3)	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	4,380	EPA, 1989	4,380	EPA, 1989	

TABLE 4.3

VALUES USED FOR DAILY INTAKE CALCULATIONS

Beede Waste Oil

Scenario Timeframe: Current/Future
Medium: Surface Water
Medium Description: Kelley Brook
Exposure Medium: Surface Water
Exposure Point: Kelley Brook and Adjacent Wetlands
Receptor Population: Other Recreational Person
Receptor Age: Child+

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Dermal	CW	Chemical Concentration in Water	µg/L	See Table 3	(3)	See Table 3	(3)	Chronic Absorbed Dose (CAD) (mg/kg-day) =
	CF1	Conversion Factor 1	mg/µg	0.001	- -	0.001	- -	CW x CF1 x PC x ET x CF2 x SA x EF x
	PC	Permeability Constant	cm/hr	(1)	(1)	(1)	(1)	ED x 1/BW x 1/AT
	ET	Exposure Time	hr/day	2	(2)	2	(2)	
	CF2	Conversion Factor 2	L/cm^3	0.001	- -	0.001	- -	
	SA	Skin Surface Area Available for Contact	cm^2	12,157	50th percentile skin exposure for: head, hands, arms, and legs; age 6-18yrs; EPA, 1997 Vol. 1 (Table 6-6 thru Table 6-8)	12,157	50th percentile skin exposure for: head, hands, arms, and legs; age 6-18yrs; EPA, 1997 Vol. 1 (Table 6-6 thru Table 6-8)	
	EF	Exposure Frequency	days/yr	110	Five (5) non-winter months and five (5) days per week; EPA, 1994	44	Five (5) non-winter months and two (2) days per week; (2)	
	ED	Exposure Duration	yrs	12	EPA, 1989	12	EPA, 1989	
	BW	Body Weight	kg	45	EPA, 1997 (Vol I: Table 7-3)	45	EPA, 1997 (Vol I: Table 7-3)	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	4,380	EPA, 1989	4,380	EPA, 1989	

(1) Refer to Table 4A - Dermal Absorption Efficiencies (PC and ABS)

(2) Professional Judgement

(3) Table 3.2 presents the COPC exposure point concentrations

+The other recreational person - child is 7-18 years old

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part A. OERR. EPA/540/189/002.

EPA, 1994: USEPA Region 1, Waste Management Division, Risk Updates. August 1994, Number 2, Attachment 2 and Attachment 3.

EPA, 1997: Exposure Factors Handbook, Volume I, Volume II, and Volume III. ORD. EPA/600/P-95/002Fc.

TABLE 4.4

VALUES USED FOR DAILY INTAKE CALCULATIONS

Beede Waste Oil

Scenario Timeframe: Current/Future
Medium: Surface Water
Medium Description: Kelley Brook
Exposure Medium: Surface Water
Exposure Point: Kelley Brook and Adjacent Wetlands
Receptor Population: Fisher
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CW	Chemical Concentration in Water	µg/L	See Table 3	(3)	See Table 3	(3)	Chronic Daily Intake (CDI) (mg/kg-day) = CW x IR x EF x ED x CF1 x 1/BW x 1/AT
	IR-W	Ingestion Rate of Water	L/day	0.05	From EPA 1989, incidental ingestion = 50mL/hr; 1hour/day (2)	0.05	From EPA 1989, incidental ingestion = 50mL/hr; 1hour/day (2)	
	EF	Exposure Frequency	days/yr	64	Five (5) non-winter months and three (3) days per week; (2)	22	Five (5) non-winter months and one (1) day per week; (2)	
	ED	Exposure Duration	yrs	24	EPA, 1994	7	EPA, 1994	
	CF1	Conversion Factor 1	mg/µg	0.001	- -	0.001	- -	
	BW	Body Weight	kg	70	EPA, 1994	70	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	8,760	EPA, 1989	2,555	EPA, 1989	

TABLE 4.4

VALUES USED FOR DAILY INTAKE CALCULATIONS

Beede Waste Oil

Scenario Timeframe: Current/Future
Medium: Surface Water
Medium Description: Kelley Brook
Exposure Medium: Surface Water
Exposure Point: Kelley Brook and Adjacent Wetlands
Receptor Population: Fisher
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Dermal	CW	Chemical Concentration in Water	µg/L	See Table 3	(3)	See Table 3	(3)	Chronic Absorbed Dose (CAD) (mg/kg-day) =
	CF1	Conversion Factor 1	mg/µg	0.001	- -	0.001	- -	CW x CF1 x PC x ET x CF2 x SA x EF x
	PC	Permeability Constant	cm/hr	(1)	(1)	(1)	(1)	ED x 1/BW x 1/AT
	ET	Exposure Time	hr/day	2	(2)	1	(2)	
	CF2	Conversion Factor 2	L/cm^3	0.001	- -	0.001	- -	
	SA	Skin Surface Area Available for Contact	cm^2	10,433	CTE for dermal exposure to head, hands, arms, and lower extremities; EPA, 1997 (Table 6-2 thru 6-5)	10,433	CTE for dermal exposure to head, hands, arms, and lower extremities; EPA, 1997 (Table 6-2 thru 6-5)	
	EF	Exposure Frequency	days/yr	64	Five (5) non-winter months and three (3) days per week; (2)	22	Five (5) non-winter months and one (1) day per week; (2)	
	ED	Exposure Duration	yrs	24	EPA, 1994	7	EPA, 1994	
	BW	Body Weight	kg	70	EPA, 1994	70	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	8,760	EPA, 1989	2,555	EPA, 1989	

(1) Refer to Table 4A - Dermal Absorption Efficiencies (PC and ABS)

(2) Professional Judgement

(3) Table 3.2 presents the COPC exposure point concentrations

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part A. OERR. EPA/540/189/002.

EPA, 1994: USEPA Region 1, Waste Management Division, Risk Updates. August 1994, Number 2, Attachment 2 and Attachment 3.

EPA, 1997: Exposure Factors Handbook, Volume I, Volume II, and Volume III. ORD. EPA/600/P-95/002Fc.

TABLE 4.5

VALUES USED FOR DAILY INTAKE CALCULATIONS

Beede Waste Oil

Scenario Timeframe: Current/Future
Medium: Other (Fish Tissue)
Medium Description: Kelley Brook
Exposure Medium: Animal Tissue
Exposure Point: Brook Trout
Receptor Population: Fisher
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CF	Chemical Concentration in Fish	mg/kg	See Table 3	(3)	See Table 3	(3)	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR-F	Ingestion Rate of Fish Tissue	kg/day	0.012	EPA, 1997 Vol. 2	0.0037	EPA, 1997 Vol. 2	CF x IR x FI x EF x ED x 1/BW x 1/AT
	FI	Fraction Ingested	unitless	1	(2)	1	(2)	
	EF	Exposure Frequency	days/yr	365	Ingestion rates derived from fish consumption over a year; ChemRisk, 1992	365	Ingestion rates derived from fish consumption over a year; ChemRisk, 1992	
	ED	Exposure Duration	yrs	24	EPA, 1994	7	EPA, 1994	
	BW	Body Weight	kg	70	EPA, 1994	70	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	8,760	EPA, 1989	2,555	EPA, 1989	

(1) Refer to Table 4A - Dermal Absorption Efficiencies (PC and ABS)

(2) Professional Judgement

(3) Table 3.3 presents the COPC exposure point concentrations

Sources:

ChemRisk, 1991:Consumption of Freshwater Fish by Maine Anglers. McLaren/Hart ChemRisk, Portland, ME.

EPA, 1989: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part A. OERR. EPA/540/189/002.

EPA, 1994: USEPA Region 1, Waste Management Division, Risk Updates. August 1994, Number 2, Attachment 2 and Attachment 3.

EPA, 1997: Exposure Factors Handbook, Volume I, Volume II, and Volume III. ORD. EPA/600/P-95/002Fc.

TABLE 4.6

VALUES USED FOR DAILY INTAKE CALCULATIONS

Beede Waste Oil

Scenario Timeframe: Current
Medium: Groundwater
Medium Description: Aquifer
Exposure Medium: Groundwater
Exposure Point: Tap Water
Receptor Population: Resident
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CW	Chemical Concentration in Water	µg/L	See Table 3	(3)	See Table 3	(3)	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR-W	Ingestion Rate of Water	L/day	2	EPA, 1994	1.4	EPA, 1994	CW x IR x EF x ED x CF1 x 1/BW x 1/AT
	EF	Exposure Frequency	day/yr	350	EPA, 1994	350	EPA, 1994	
	ED	Exposure Duration	yrs	24	(2)	7	(2)	
	CF1	Conversion Factor 1	mg/µg	0.001	- -	0.001	- -	
	BW	Body Weight	kg	70	EPA, 1994	70	EPA, 1994	
	AT-C	Averaging Time (Cancer)	day	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	day	8,760	EPA, 1989	2,555	EPA, 1989	

TABLE 4.6

VALUES USED FOR DAILY INTAKE CALCULATIONS

Beede Waste Oil

Scenario Timeframe: Current
Medium: Groundwater
Medium Description: Aquifer
Exposure Medium: Groundwater
Exposure Point: Tap Water
Receptor Population: Resident
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Dermal	CW	Chemical Concentration in Water	µg/L	See Table 3	(3)	See Table 3	(3)	Chronic Absorbed Dose (CAD) (mg/kg-day) =
	CF1	Conversion Factor 1	mg/µg	0.001	- -	0.001	- -	CW x CF1 x PC x ET x CF2 x SA x EF x
	PC	Permeability Constant	cm/hr	(1)	(1)	(1)	(1)	ED x 1/BW x 1/AT
	ET	Exposure Time	hr/day	1	95th percentile bathing time; EPA 1997 (Volume III - Table 15-26)	0.33	50th percentile bathing time; EPA 1997 (Volume III - Table 15-26)	
	CF2	Conversion Factor 2	L/cm^3	0.001	- -	0.001	- -	
	SA	Skin Surface Area Available for Contact	cm^2	18,150	50th percentile for whole body; EPA 1997 (Table 6-2 and 6-3)	18,150	50th percentile for whole body; EPA 1997 (Table 6-2 and 6-3)	
	EF	Exposure Frequency	days/yr	350	EPA, 1994	350	EPA, 1994	
	ED	Exposure Duration	yrs	24	(2)	7	(2)	
	BW	Body Weight	kg	70	EPA, 1994	70	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	8,760	EPA, 1989	2,555	EPA, 1989	

(1) Refer to Table 4A - Dermal Absorption Efficiencies (PC and ABS)

(2) Professional Judgement

(3) Table 3.4 presents the COPC exposure point concentrations

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part A. OERR. EPA/540/189/002.

EPA, 1994: USEPA Region 1, Waste Management Division, Risk Updates. August 1994, Number 2, Attachment 2 and Attachment 3.

EPA, 1997: Exposure Factors Handbook, Volume I, Volume II, and Volume III. ORD. EPA/600/P-95/002Fc.

TABLE 4.7

VALUES USED FOR DAILY INTAKE CALCULATIONS

Beede Waste Oil

Scenario Timeframe: Current
Medium: Groundwater
Medium Description: Aquifer
Exposure Medium: Groundwater
Exposure Point: Tap Water
Receptor Population: Resident
Receptor Age: Child+

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CW	Chemical Concentration in Water	µg/L	See Table 3	(3)	See Table 3	(3)	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR-W	Ingestion Rate of Water	L/day	1.5	90th percentile; 3-5 yrs; EPA, 1997, Table 3-33	0.87	50th percentile; 3-5 yrs; EPA, 1997, Table 3-33	CW x IR x EF x ED x CF1 x 1/BW x 1/AT
	EF	Exposure Frequency	day/yr	350	EPA, 1994	350	EPA, 1994	
	ED	Exposure Duration	yrs	6	EPA, 1994	2	EPA, 1994	
	CF1	Conversion Factor 1	mg/µg	0.001	- -	0.001	- -	
	BW	Body Weight	kg	15	EPA, 1994	15	EPA, 1994	
	AT-C	Averaging Time (Cancer)	day	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	day	2,190	EPA, 1989	730	EPA, 1989	

TABLE 4.7

VALUES USED FOR DAILY INTAKE CALCULATIONS

Beede Waste Oil

Scenario Timeframe: Current
Medium: Groundwater
Medium Description: Aquifer
Exposure Medium: Groundwater
Exposure Point: Tap Water
Receptor Population: Resident
Receptor Age: Child+

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Dermal	CW	Chemical Concentration in Water	µg/L	See Table 3	(3)	See Table 3	(3)	Chronic Absorbed Dose (CAD) (mg/kg-day) =
	CF1	Conversion Factor 1	mg/µg	0.001	- -	0.001	- -	CW x CF1 x PC x ET x CF2 x SA x EF x
	PC	Permeability Constant	cm/hr	(1)	(1)	(1)	(1)	ED x 1/BW x 1/AT
	ET	Exposure Time	hr/day	1	95th percentile bathing time; EPA 1997 (Volume III - Table 15-26)	0.33	50th percentile bathing time; EPA 1997 (Volume III - Table 15-26)	
	CF2	Conversion Factor 2	L/cm^3	0.001	- -	0.001	- -	
	SA	Skin Surface Area Available for Contact	cm^2	6,880	50th percentile for whole body; EPA 1997 (Table 6-6 & 6-7)	6,880	50th percentile for whole body; EPA 1997 (Table 6-6 & 6-7)	
	EF	Exposure Frequency	days/yr	350	EPA, 1994	350	EPA, 1994	
	ED	Exposure Duration	yrs	6	EPA, 1994	2	EPA, 1994	
	BW	Body Weight	kg	15	EPA, 1994	15	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	2,190	EPA, 1989	730	EPA, 1989	

(1) Refer to Table 4A - Dermal Absorption Efficiencies (PC and ABS)

(2) Professional Judgement

(3) Table 3.4 presents the COPC exposure point concentrations

+Resident - child is 0-6 years old

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part A. OERR. EPA/540/189/002.

EPA, 1994: USEPA Region 1, Waste Management Division, Risk Updates. August 1994, Number 2, Attachment 2 and Attachment 3.

EPA, 1997: Exposure Factors Handbook, Volume I, Volume II, and Volume III. ORD. EPA/600/P-95/002Fc.

TABLE 4.8

VALUES USED FOR DAILY INTAKE CALCULATIONS

Beede Waste Oil

Scenario Timeframe: Current
Medium: Soil
Medium Description: Parcel 1 and Parcel 2 soil, 0 to 1 foot
Exposure Medium: Surface Soil
Exposure Point: 0 to 1 foot soil
Receptor Population: Trespasser/Visitor
Receptor Age: Child +

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CS	Chemical Concentration in Soil	mg/kg	See Table 3	(3)	See Table 3	(3)	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR-S	Ingestion Rate of Soil	mg/day	100	EPA, 1994	50	EPA, 1994	CS x IR x CF1 x FI x EF x ED x
	CF1	Conversion Factor	kg/mg	10^{-6}	- -	10^{-6}	- -	1/BW x 1/AT
	FI	Fraction Ingested	unitless	1	(2)	1	(2)	
	EF	Exposure Frequency	days/yr	110	Five (5) non-winter months and five (5) days per week - May - September; EPA, 1994	44	Five (5) non-winter months and two (2) days per week - May - September; (2)	
	ED	Exposure Duration	yrs	12	EPA, 1989	12	EPA, 1989	
	BW	Body Weight	kg	45	EPA, 1997 (Vol I: Table 7-3)	45	EPA, 1997 (Vol I: Table 7-3)	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	4,380	EPA, 1989	4,380	EPA, 1989	

TABLE 4.8

VALUES USED FOR DAILY INTAKE CALCULATIONS

Beede Waste Oil

Scenario Timeframe: Current
Medium: Soil
Medium Description: Parcel 1 and Parcel 2 soil, 0 to 1 foot
Exposure Medium: Surface Soil
Exposure Point: 0 to 1 foot soil
Receptor Population: Trespasser/Visitor
Receptor Age: Child +

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Dermal	CS	Chemical Concentration in Soil	mg/kg	See Table 3	(3)	See Table 3	(3)	Chronic Absorbed Dose (CAD) (mg/kg-day) =
	CF1	Conversion Factor 1	kg/mg	10^{-6}	- -	10^{-6}	- -	CS x CF1 x SA x AF x ABS x EF x ED x
	SA	Skin Surface Area Available for Contact	cm^2/event	3,500	EPA Region I Guidance	3,500	EPA Region I Guidance	1/BW x 1/AT
	AF	Soil to Skin Adherence Factor	mg/cm^2	0.07	Holmes et al. 1999; Kissel et al. 1998	0.01	Holmes et al. 1999; Kissel et al. 1998	
	ABS	Absorption Factor	unitless	(1)	(1)	(1)	(1)	
	EF	Exposure Frequency	events/yr	110	Five (5) non-winter months and five (5) days per week - May - September; EPA, 1994	44	Five (5) non-winter months and two (2) days per week - May - September; (2)	
	ED	Exposure Duration	yrs	12	EPA, 1989	12	EPA, 1989	
	BW	Body Weight	kg	45	EPA, 1997 (Vol I: Table 7-3)	45	EPA, 1997 (Vol I: Table 7-3)	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	4,380	EPA, 1989	4,380	EPA, 1989	

(1) Refer to Table 4A - Dermal Absorption Efficiencies (PC and ABS)

(2) Professional Judgement

(3) Table 3.5 presents the COPC exposure point concentrations

+ The trespasser/visitor - child is 7-18 years old

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part A. OERR. EPA/540/189/002.

EPA, 1994: USEPA Region 1, Waste Management Division, Risk Updates. August 1994, Number 2, Attachment 2 and Attachment 3.

EPA, 1997: Exposure Factors Handbook, Volume I, Volume II, and Volume III. ORD. EPA/600/P-95/002Fc.

EPA Region I Guidance, 2000: excerpt from draft EPA Dermal Guidance.

Holmes, K.K. Jr., Shirai, J.H., Richter, K.Y., and Kissel, J.C., 1999: Field Measurement of dermal soil loadings in occupational and recreational activities. *Environmental Research* 80:148-157.

Kissel, J., Shirai, J.H., Richter, K.Y., and Fenske, R.A., 1998: Investigation of Dermal Contact with Soil in Controlled Trials. J. Soil Contamination 7:737-752.

TABLE 4.9

VALUES USED FOR DAILY INTAKE CALCULATIONS

Beede Waste Oil

Scenario Timeframe: Current
Medium: Soil
Medium Description: Parcel 1 and Parcel 2 soil, 0 to 1 foot
Exposure Medium: Particulates
Exposure Point: Fugitive Dust
Receptor Population: Trespasser/Visitor
Receptor Age: Child+

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation - Dust	CA	Site-Specific or Modeled Air Concentration - Dust	mg/m^3	See Table 3	(3)	See Table 3	(3)	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR-I	Inhalation Rate	m^3/hr	0.55	7-18 year old; EPA 1997 (Vol. I: Table 5-23)	0.55	6-18 year old; EPA 1997 (Vol. I: Table 5-23)	CA x IR x ET x EF x ED x 1/AT x 1/BW
	ET	Exposure Time	hr/day	2	(2)	2	(2)	
	EF	Exposure Frequency	days/yr	110	Five (5) non-winter months and five (5) days per week - May - September; EPA, 1994	44	Five (5) non-winter months and two (2) days per week - May - September; (2)	
	ED	Exposure Duration	yrs	12	EPA, 1989	12	EPA, 1989	
	BW	Body Weight	kg	45	EPA, 1997 (Vol I: Table 7-3)	45	EPA, 1997 (Vol I: Table 7-3)	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	4,380	EPA, 1989	4,380	EPA, 1989	

(1) Refer to Table 4A - Dermal Absorption Efficiencies (PC and ABS)

(2) Professional Judgement

(3) Table 3.6 presents the COPC exposure point concentrations. Refer to Table I-1 for model parameters.

+ The trespasser/visitor - child is 7-18 years old

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part A. OERR. EPA/540/189/002.

EPA, 1994: USEPA Region 1, Waste Management Division, Risk Updates. August 1994, Number 2, Attachment 2 and Attachment 3.

EPA, 1997: Exposure Factors Handbook, Volume I, Volume II, and Volume III. ORD. EPA/600/P-95/002Fc.

TABLE 4.10

VALUES USED FOR DAILY INTAKE CALCULATIONS

Beede Waste Oil

Scenario Timeframe: Current
Medium: Soil
Medium Description: Parcel 1 and Parcel 2 soil, 0 to 1 foot
Exposure Medium: Vapors
Exposure Point: Vapors from Surface Soil
Receptor Population: Trespasser/Visitor
Receptor Age: Child+

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation - Vapor	CA	Site-Specific or Modeled Air Concentration - Vapor	mg/m^3	See Table 3	(3)	See Table 3	(3)	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR-I	Inhalation Rate	m^3/hr	0.55	6-18 year old; EPA 1997 (Vol. I: Table 5-23)	0.55	6-18 year old; EPA 1997 (Vol. I: Table 5-23)	CA x IR x ET x EF x ED x 1/AT x 1/BW
	ET	Exposure Time	hr/day	2	(2)	2	(2)	
	EF	Exposure Frequency	days/yr	110	Five (5) non-winter months and five (5) days per week - May - September; EPA, 1994	44	Five (5) non-winter months and two (2) days per week - May September; (2)	
	ED	Exposure Duration	yrs	12	EPA, 1989	12	EPA, 1989	
	BW	Body Weight	kg	45	EPA, 1997 (Vol I: Table 7-3)	45	EPA, 1997 (Vol I: Table 7-3)	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	4,380	EPA, 1989	4,380	EPA, 1989	

(1) Refer to Table 4A - Dermal Absorption Efficiencies (PC and ABS)

(2) Professional Judgement

(3) Table 3.7 presents the COPC exposure point concentrations. Refer to Table I-2 for model parameters.

+ The trespasser/visitor - child is 7-18 years old

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part A. OERR. EPA/540/189/002.

EPA, 1994: USEPA Region 1, Waste Management Division, Risk Updates. August 1994, Number 2, Attachment 2 and Attachment 3.

EPA, 1997: Exposure Factors Handbook, Volume I, Volume II, and Volume III. ORD. EPA/600/P-95/002Fc.

TABLE 4.11

VALUES USED FOR DAILY INTAKE CALCULATIONS

Beede Waste Oil

Scenario Timeframe: Future
Medium: Groundwater
Medium Description: Aquifer
Exposure Medium: Groundwater
Exposure Point: Excavation Site
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CW	Chemical Concentration in Water	µg/L	See Table 3	(3)	See Table 3	(3)	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR-W	Ingestion Rate of Water	L/day	0.05	From EPA 1989, incidental ingestion = 50mL/hr; 1hour/day (2)	0.05	From EPA 1989, incidental ingestion = 50mL/hr; 1hour/day (2)	CW x IR x EF x ED x CF1 x 1/BW x 1/AT
	EF	Exposure Frequency	days/yr	150	EPA, 1994	90	(2)	
	ED	Exposure Duration	yrs	1	(2)	1	(2)	
	CF1	Conversion Factor 1	mg/µg	0.001	- -	0.001	- -	
	BW	Body Weight	kg	70	EPA, 1994	70	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	365	EPA, 1989	365	EPA, 1989	

TABLE 4.11

VALUES USED FOR DAILY INTAKE CALCULATIONS

Beede Waste Oil

Scenario Timeframe: Future
Medium: Groundwater
Medium Description: Aquifer
Exposure Medium: Groundwater
Exposure Point: Excavation Site
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Dermal	CW	Chemical Concentration in Water	µg/L	See Table 3	(3)	See Table 3	(3)	Chronic Absorbed Dose (CAD) (mg/kg-day) =
	CF1	Conversion Factor 1	mg/µg	0.001	- -	0.001	- -	CW x CF1 x PC x ET x CF2 x SA x EF x
	PC	Permeability Constant	cm/hr	(1)	(1)	(1)	(1)	ED x 1/BW x 1/AT
	ET	Exposure Time	hr/day	12.2	95th percentile - time spent at work per day; EPA 1997 (Vol III: Table 15-48)	8	50th percentile - time spent at work per day; EPA 1997 (Vol III: Table 15-48)	
	CF2	Conversion Factor 2	L/cm^3	0.001	- -	0.001	- -	
	SA	Skin Surface Area Available for Contact	cm^2	10,433	CTE for dermal exposure to head, hands, arms, and lower extremities; EPA, 1997 (Table 6-2 thru 6-5)	10,433	CTE for dermal exposure to head, hands, arms, and lower extremities; EPA, 1997 (Table 6-2 thru 6-5)	
	EF	Exposure Frequency	days/yr	150	EPA, 1994	90	(2)	
	ED	Exposure Duration	yrs	1	(2)	1	(2)	
	BW	Body Weight	kg	70	EPA, 1994	70	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	365	EPA, 1989	365	EPA, 1989	

(1) Refer to Table 4A - Dermal Absorption Efficiencies (PC and ABS)

(2) Professional Judgement

(3) Table 3.8 presents the COPC exposure point concentrations

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part A. OERR. EPA/540/189/002.

EPA, 1994: USEPA Region 1, Waste Management Division, Risk Updates. August 1994, Number 2, Attachment 2 and Attachment 3.

EPA, 1997: Exposure Factors Handbook, Volume I, Volume II, and Volume III. ORD. EPA/600/P-95/002Fc.

TABLE 4.12

VALUES USED FOR DAILY INTAKE CALCULATIONS

Beede Waste Oil

Scenario Timeframe: Future
Medium: Groundwater
Medium Description: Aquifer
Exposure Medium: Groundwater
Exposure Point: Tap Water
Receptor Population: Resident
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CW	Chemical Concentration in Water	µg/L	See Table 3	(3)	See Table 3	(3)	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR-W	Ingestion Rate of Water	L/day	2	EPA, 1994	1.4	EPA, 1994	CW x IR x EF x ED x CF1 x 1/BW x 1/AT
	EF	Exposure Frequency	day/yr	350	EPA, 1994	350	EPA, 1994	
	ED	Exposure Duration	yrs	24	EPA, 1994	7	EPA, 1994	
	CF1	Conversion Factor 1	mg/µg	0.001	- -	0.001	- -	
	BW	Body Weight	kg	70	EPA, 1994	70	EPA, 1994	
	AT-C	Averaging Time (Cancer)	day	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	day	8,760	EPA, 1989	2,555	EPA, 1989	

TABLE 4.12

VALUES USED FOR DAILY INTAKE CALCULATIONS

Beede Waste Oil

Scenario Timeframe: Future
Medium: Groundwater
Medium Description: Aquifer
Exposure Medium: Groundwater
Exposure Point: Tap Water
Receptor Population: Resident
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Dermal	CW	Chemical Concentration in Water	µg/L	See Table 3	(3)	See Table 3	(3)	Chronic Absorbed Dose (CAD) (mg/kg-day) =
	CF1	Conversion Factor 1	mg/µg	0.001	- -	0.001	- -	CW x CF1 x PC x ET x CF2 x SA x EF x
	PC	Permeability Constant	cm/hr	(1)	(1)	(1)	(1)	ED x 1/BW x 1/AT
	ET	Exposure Time	hr/day	1	95th percentile bathing time; EPA 1997 (Volume III - Table 15-26)	0.33	50th percentile bathing time; EPA 1997 (Volume III - Table 15-26)	
	CF2	Conversion Factor 2	L/cm^3	0.001	- -	0.001	- -	
	SA	Skin Surface Area Available for Contact	cm^2	18,150	50th percentile for whole body; EPA 1997 (Table 6-2 and 6-3)	18,150	50th percentile for whole body; EPA 1997 (Table 6-2 and 6-3)	
	EF	Exposure Frequency	days/yr	350	EPA, 1994	350	EPA, 1994	
	ED	Exposure Duration	yrs	24	EPA, 1994	7	EPA, 1994	
	BW	Body Weight	kg	70	EPA, 1994	70	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	8,760	EPA, 1989	2,555	EPA, 1989	

(1) Refer to Table 4A - Dermal Absorption Efficiencies (PC and ABS)

(2) Professional Judgement

(3) Table 3.9 presents the COPC exposure point concentrations

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part A. OERR. EPA/540/189/002.

EPA, 1994: USEPA Region 1, Waste Management Division, Risk Updates. August 1994, Number 2, Attachment 2 and Attachment 3.

EPA, 1997: Exposure Factors Handbook, Volume I, Volume II, and Volume III. ORD. EPA/600/P-95/002Fc.

TABLE 4.13

VALUES USED FOR DAILY INTAKE CALCULATIONS

Beede Waste Oil

Scenario Timeframe: Future
Medium: Groundwater
Medium Description: Aquifer
Exposure Medium: Groundwater
Exposure Point: Tap Water
Receptor Population: Resident
Receptor Age: Child[+]

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CW	Chemical Concentration in Water	µg/L	See Table 3	(3)	See Table 3	(3)	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR-W	Ingestion Rate of Water	L/day	1.5	90th percentile; 3-5 yrs; EPA, 1997, Table 3-33	0.87	50th percentile; 3-5 yrs; EPA, 1997, Table 3-33	CW x IR x EF x ED x CF1 x 1/BW x 1/AT
	EF	Exposure Frequency	day/yr	350	EPA, 1994	350	EPA, 1994	
	ED	Exposure Duration	yrs	6	EPA, 1994	2	EPA, 1994	
	CF1	Conversion Factor 1	mg/µg	0.001	- -	0.001	- -	
	BW	Body Weight	kg	15	EPA, 1994	15	EPA, 1994	
	AT-C	Averaging Time (Cancer)	day	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	day	2,190	EPA, 1989	730	EPA, 1989	

TABLE 4.13

VALUES USED FOR DAILY INTAKE CALCULATIONS

Beede Waste Oil

Scenario Timeframe: Future
Medium: Groundwater
Medium Description: Aquifer
Exposure Medium: Groundwater
Exposure Point: Tap Water
Receptor Population: Resident
Receptor Age: Child+

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Dermal	CW	Chemical Concentration in Water	µg/L	See Table 3	(3)	See Table 3	(3)	Chronic Absorbed Dose (CAD) (mg/kg-day) =
	CF1	Conversion Factor 1	mg/µg	0.001	- -	0.001	- -	CW x CF1 x PC x ET x CF2 x SA x EF x
	PC	Permeability Constant	cm/hr	(1)	(1)	(1)	(1)	ED x 1/BW x 1/AT
	ET	Exposure Time	hr/day	1	95th percentile bathing time; EPA 1997 (Volume III - Table 15-26)	0.33	50th percentile bathing time; EPA 1997 (Volume III - Table 15-26)	
	CF2	Conversion Factor 2	L/cm^3	0.001	- -	0.001	- -	
	SA	Skin Surface Area Available for Contact	cm^2	6,880	50th percentile for whole body; EPA 1997 (Table 6-6 thru 6-8)	6,880	50th percentile for whole body; EPA 1997 (Table 6-6 thru 6-8)	
	EF	Exposure Frequency	days/yr	350	EPA, 1994	350	EPA, 1994	
	ED	Exposure Duration	yrs	6	EPA, 1994	2	EPA, 1994	
	BW	Body Weight	kg	15	EPA, 1994	15	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	2,190	EPA, 1989	730	EPA, 1989	

(1) Refer to Table 4A - Dermal Absorption Efficiencies (PC and ABS)

(2) Professional Judgement

(3) Table 3.9 presents the COPC exposure point concentrations.

+The resident-child is 0-6 years old

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part A. OERR. EPA/540/189/002.

EPA, 1994: USEPA Region 1, Waste Management Division, Risk Updates. August 1994, Number 2, Attachment 2 and Attachment 3.

EPA, 1997: Exposure Factors Handbook, Volume I, Volume II, and Volume III. ORD. EPA/600/P-95/002Fc.

TABLE 4.14

VALUES USED FOR DAILY INTAKE CALCULATIONS

Beede Waste Oil

Scenario Timeframe: Future
Medium: Soil
Medium Description: Parcel 1 and Parcel 2 soil, 0 to 10 feet
Exposure Medium: Surface and Subsurface Soil
Exposure Point: 0 to 10 foot soil at excavation site
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CS	Chemical Concentration in Soil	mg/kg	See Table 3	(3)	See Table 3	(3)	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR-S	Ingestion Rate of Soil	mg/day	480	Contact intensive; EPA, 1994	480	Contact intensive; EPA, 1994	CS x IR x CF1 x FI x EF x ED x
	CF1	Conversion Factor	kg/mg	10^{-6}	- -	10^{-6}	- -	1/BW x 1/AT
	FI	Fraction Ingested	unitless	1	(2)	1	(2)	
	EF	Exposure Frequency	days/yr	150	EPA, 1994	90	(2)	
	ED	Exposure Duration	yrs	1	(2)	1	(2)	
	BW	Body Weight	kg	70	EPA, 1994	70	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	365	EPA, 1989	365	EPA, 1989	

TABLE 4.14

VALUES USED FOR DAILY INTAKE CALCULATIONS

Beede Waste Oil

Scenario Timeframe: Future
Medium: Soil
Medium Description: Parcel 1 and Parcel 2 soil, 0 to 10 feet
Exposure Medium: Surface and Subsurface Soil
Exposure Point: 0 to 10 foot soil at excavation site
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Dermal	CS	Chemical Concentration in Soil	mg/kg	See Table 3	(3)	See Table 3	(3)	Chronic Absorbed Dose (CAD) (mg/kg-day) =
	CF1	Conversion Factor 1	kg/mg	10^{-6}	- -	10^{-6}	- -	CS x CF1 x SA x AF x ABS x EF x ED x
	SA	Skin Surface Area Available for Contact	cm^2/event	10,433	CTE skin exposure for: head, hands, arms and lower extremities (employment enhanced); EPA, 1997 Vol. 1 (Table 6-2 thru Table 6-5)	10,433	CTE skin exposure for: head, hands, arms and lower extremities (employment enhanced); EPA, 1997 Vol. 1 (Table 6-2 thru Table 6-5)	1/BW x 1/AT
	AF	Soil to Skin Adherence Factor	mg/cm^2	0.07	Holmes et al. 1999; Kissel et al. 1998	0.07	Holmes et al. 1999; Kissel et al. 1998	
	ABS	Absorption Factor	unitless	(1)	(1)	(1)	(1)	
	EF	Exposure Frequency	events/yr	150	EPA, 1994	90	(2)	
	ED	Exposure Duration	yrs	1	(2)	1	(2)	
	BW	Body Weight	kg	70	EPA, 1994	70	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	365	EPA, 1989	365	EPA, 1989	

(1) Refer to Table 4A - Dermal Absorption Efficiencies (PC and ABS)

(2) Professional Judgement

(3) Table 3.11 presents the COPC exposure point concentrations.

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part A. OERR. EPA/540/189/002.

EPA, 1994: USEPA Region 1, Waste Management Division, Risk Updates. August 1994, Number 2, Attachment 2 and Attachment 3.

EPA, 1997: Exposure Factors Handbook, Volume I, Volume II, and Volume III. ORD. EPA/600/P-95/002Fc.

Holmes, K.K. Jr., Shirai, J.H., Richter, K.Y., and Kissel, J.C., 1999: Field Measurement of dermal soil loadings in occupational and recreational activities. *Environmental Research* 80:148-157.

Kissel, J., Shirai, J.H., Richter, K.Y., and Fenske, R.A., 1998: Investigation of Dermal Contact with Soil in Controlled Trials. J. Soil Contamination 7:737-752.

TABLE 4.15

VALUES USED FOR DAILY INTAKE CALCULATIONS

Beede Waste Oil

Scenario Timeframe: Future
Medium: Soil
Medium Description: Parcel 1 and Parcel 2 soil, 0 to 10 feet
Exposure Medium: Surface and Subsurface Soil
Exposure Point: 0 to 10 foot soil
Receptor Population: Resident
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CS	Chemical Concentration in Soil	mg/kg	See Table 3	(3)	See Table 3	(3)	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR-S	Ingestion Rate of Soil	mg/day	100	EPA, 1994	50	EPA, 1994	CS x IR x CF1 x FI x EF x ED x
	CF1	Conversion Factor	kg/mg	10^{-6}	- -	10^{-6}	- -	1/BW x 1/AT
	FI	Fraction Ingested	unitless	1	(2)	1	(2)	
	EF	Exposure Frequency	days/yr	160	DES, 1998, Appendix A	160	DES, 1998, Appendix A	
	ED	Exposure Duration	yrs	24	EPA, 1994	7	EPA, 1994	
	BW	Body Weight	kg	70	EPA, 1994	70	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	8,760	EPA, 1989	2,555	EPA, 1989	

TABLE 4.15

VALUES USED FOR DAILY INTAKE CALCULATIONS

Beede Waste Oil

Scenario Timeframe: Future
Medium: Soil
Medium Description: Parcel 1 and Parcel 2 soil, 0 to 10 feet
Exposure Medium: Surface and Subsurface Soil
Exposure Point: 0 to 10 foot soil
Receptor Population: Resident
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Dermal	CS	Chemical Concentration in Soil	mg/kg	See Table 3	(3)	See Table 3	(3)	Chronic Absorbed Dose (CAD) (mg/kg-day) =
	CF1	Conversion Factor 1	kg/mg	10^{-6}	- -	10^{-6}	- -	CS x CF1 x SA x AF x ABS x EF x ED x
	SA	Skin Surface Area Available for Contact	cm^2/event	5,700	EPA, 1997	5,700	EPA, 1997	1/BW x 1/AT
	AF	Soil to Skin Adherence Factor	mg/cm^2	0.07	Holmes et al. 1999; Kissel et al. 1998	0.01	Holmes et al. 1999; Kissel et al. 1998	
	ABS	Absorption Factor	unitless	(1)	(1)	(1)	(1)	
	EF	Exposure Frequency	events/yr	160	DES, 1998, Appendix A	160	DES, 1998, Appendix A	
	ED	Exposure Duration	yrs	24	EPA, 1994	7	EPA, 1994	
	BW	Body Weight	kg	70	EPA, 1994	70	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	8,760	EPA, 1989	2,555	EPA, 1989	

(1) Refer to Table 4A - Dermal Absorption Efficiencies (PC and ABS)

(2) Professional Judgement

(3) Table 3.10 presents the COPC exposure point concentrations.

Sources:

DES, 1998; Contaminated Sites Risk Characterization and Management Policy, New Hampshire Department of Environmental Services. January 1998, Appendix A. p. 4.

EPA, 1989: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part A. OERR. EPA/540/189/002.

EPA, 1994: USEPA Region 1, Waste Management Division, Risk Updates. August 1994, Number 2, Attachment 2 and Attachment 3.

EPA, 1997: Exposure Factors Handbook, Volume I, Volume II, and Volume III. ORD. EPA/600/P-95/002Fc.

Holmes, K.K. Jr., Shirai, J.H., Richter, K.Y., and Kissel, J.C., 1999: Field Measurement of dermal soil loadings in occupational and recreational activities. *Environmental Research* 80:148-157.

TABLE 4.16

VALUES USED FOR DAILY INTAKE CALCULATIONS

Beede Waste Oil

Scenario Timeframe: Future
Medium: Soil
Medium Description: Parcel 1 and Parcel 2 soil, 0 to 1 foot
Exposure Medium: Surface Soil
Exposure Point: 0 to 1 foot soil
Receptor Population: Resident
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CS	Chemical Concentration in Soil	mg/kg	See Table 3	(3)	See Table 3	(3)	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR-S	Ingestion Rate of Soil	mg/day	100	EPA, 1994	50	EPA, 1994	CS x IR x CF1 x FI x EF x ED x
	CF1	Conversion Factor	kg/mg	10^{-6}	- -	10^{-6}	- -	1/BW x 1/AT
	FI	Fraction Ingested	unitless	1	(2)	1	(2)	
	EF	Exposure Frequency	days/yr	160	DES, 1998, Appendix A	160	DES, 1998, Appendix A	
	ED	Exposure Duration	yrs	24	EPA, 1994	7	EPA, 1994	
	BW	Body Weight	kg	70	EPA, 1994	70	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	8,760	EPA, 1989	2,555	EPA, 1989	

TABLE 4.16

VALUES USED FOR DAILY INTAKE CALCULATIONS

Beede Waste Oil

Scenario Timeframe: Future
Medium: Soil
Medium Description: Parcel 1 and Parcel 2 soil, 0 to 1 foot
Exposure Medium: Surface Soil
Exposure Point: 0 to 1 foot soil
Receptor Population: Resident
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Dermal	CS	Chemical Concentration in Soil	mg/kg	See Table 3	(3)	See Table 3	(3)	Chronic Absorbed Dose (CAD) (mg/kg-day) =
	CF1	Conversion Factor 1	kg/mg	10^{-6}	- -	10^{-6}	- -	CS x CF1 x SA x AF x ABS x EF x ED x
	SA	Skin Surface Area Available for Contact	cm^2/event	5,700	EPA, 1997	5,700	EPA, 1997	1/BW x 1/AT
	AF	Soil to Skin Adherence Factor	mg/cm^2	0.07	Holmes et al. 1999; Kissel et al. 1998	0.01	Holmes et al. 1999; Kissel et al. 1998	
	ABS	Absorption Factor	unitless	(1)	(1)	(1)	(1)	
	EF	Exposure Frequency	events/yr	160	DES, 1998, Appendix A	160	DES, 1998, Appendix A	
	ED	Exposure Duration	yrs	24	EPA, 1994	7	EPA, 1994	
	BW	Body Weight	kg	70	EPA, 1994	70	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	8,760	EPA, 1989	2,555	EPA, 1989	

(1) Refer to Table 4A - Dermal Absorption Efficiencies (PC and ABS)

(2) Professional Judgement

(3) Table 3.14 presents the COPC exposure point concentrations.

Sources:

DES, 1998; Contaminated Sites Risk Characterization and Management Policy, New Hampshire Department of Environmental Services. January 1998, Appendix A. p. 4.

EPA, 1989: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part A. OERR. EPA/540/189/002.

EPA, 1994: USEPA Region 1, Waste Management Division, Risk Updates. August 1994, Number 2, Attachment 2 and Attachment 3.

EPA, 1997: Exposure Factors Handbook, Volume I, Volume II, and Volume III. ORD. EPA/600/P-95/002Fc.

Holmes, K.K. Jr., Shirai, J.H., Richter, K.Y., and Kissel, J.C., 1999: Field Measurement of dermal soil loadings in occupational and recreational activities. *Environmental Research* 80:148-157.

TABLE 4.17

VALUES USED FOR DAILY INTAKE CALCULATIONS

Beede Waste Oil

Scenario Timeframe: Future
Medium: Soil
Medium Description: Parcel 1 and Parcel 2 soil, 0 to 10 feet
Exposure Medium: Surface and Subsurface Soil
Exposure Point: 0 to 10 foot soil
Receptor Population: Resident
Receptor Age: Child+

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CS	Chemical Concentration in Soil	mg/kg	See Table 3	(3)	See Table 3	(3)	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR-S	Ingestion Rate of Soil	mg/day	200	EPA, 1994	100	EPA, 1994	CS x IR x CF1 x FI x EF x ED x
	CF1	Conversion Factor	kg/mg	10^{-6}	- -	10^{-6}	- -	1/BW x 1/AT
	FI	Fraction Ingested	unitless	1	(2)	1	(2)	
	EF	Exposure Frequency	days/yr	160	DES, 1998, Appendix A	160	DES, 1998, Appendix A	
	ED	Exposure Duration	yrs	6	EPA, 1994	2	EPA, 1994	
	BW	Body Weight	kg	15	EPA, 1994	15	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	2,190	EPA, 1989	730	EPA, 1989	

TABLE 4.17

VALUES USED FOR DAILY INTAKE CALCULATIONS

Beede Waste Oil

Scenario Timeframe: Future
Medium: Soil
Medium Description: Parcel 1 and Parcel 2 soil, 0 to 10 feet
Exposure Medium: Surface and Subsurface Soil
Exposure Point: 0 to 10 foot soil
Receptor Population: Resident
Receptor Age: Child+

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Dermal	CS	Chemical Concentration in Soil	mg/kg	See Table 3	(3)	See Table 3	(3)	Chronic Absorbed Dose (CAD) (mg/kg-day) =
	CF1	Conversion Factor 1	kg/mg	10^{-6}	- -	10^{-6}	- -	CS x CF1 x SA x AF x ABS x EF x ED x
	SA	Skin Surface Area Available for Contact	cm^2/event	2,900	EPA, 1997	2,900	EPA, 1997	1/BW x 1/AT
	AF	Soil to Skin Adherence Factor	mg/cm^2	0.2	Holmes et al. 1999; Kissel et al. 1998	0.06	Holmes et al. 1999; Kissel et al. 1998	
	ABS	Absorption Factor	unitless	(1)	(1)	(1)	(1)	
	EF	Exposure Frequency	events/yr	160	DES, 1998, Appendix A	160	DES, 1998, Appendix A	
	ED	Exposure Duration	yrs	6	EPA, 1994	2	EPA, 1994	
	BW	Body Weight	kg	15	EPA, 1994	15	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	2,190	EPA, 1989	730	EPA, 1989	

(1) Refer to Table 4A - Dermal Absorption Efficiencies (PC and ABS)

(2) Professional Judgement

(3) Table 3.10 presents the COPC exposure point concentrations.

+ The resident - child is 0-6 years old

Sources:

DES, 1998; Contaminated Sites Risk Characterization and Management Policy, New Hampshire Department of Environmental Services. January 1998, Appendix A. p. 4.

EPA, 1989: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part A. OERR. EPA/540/189/002.

EPA, 1994: USEPA Region 1, Waste Management Division, Risk Updates. August 1994, Number 2, Attachment 2 and Attachment 3.

EPA, 1997: Exposure Factors Handbook, Volume I, Volume II, and Volume III. ORD. EPA/600/P-95/002Fc.

Holmes, K.K. Jr., Shirai, J.H., Richter, K.Y., and Kissel, J.C., 1999: Field Measurement of dermal soil loadings in occupational and recreational activities. *Environmental Research* 80:148-157.

TABLE 4.18

VALUES USED FOR DAILY INTAKE CALCULATIONS

Beede Waste Oil

Scenario Timeframe: Future
Medium: Soil
Medium Description: Parcel 1 and Parcel 2 soil, 0 to 1 foot
Exposure Medium: Surface Soil
Exposure Point: 0 to 1 foot soil
Receptor Population: Resident
Receptor Age: Child+

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CS	Chemical Concentration in Soil	mg/kg	See Table 3	(3)	See Table 3	(3)	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR-S	Ingestion Rate of Soil	mg/day	200	EPA, 1994	100	EPA, 1994	CS x IR x CF1 x FI x EF x ED x
	CF1	Conversion Factor	kg/mg	10^{-6}	- -	10^{-6}	- -	1/BW x 1/AT
	FI	Fraction Ingested	unitless	1	(2)	1	(2)	
	EF	Exposure Frequency	days/yr	160	DES, 1998, Appendix A	160	DES, 1998, Appendix A	
	ED	Exposure Duration	yrs	6	EPA, 1994	2	EPA, 1994	
	BW	Body Weight	kg	15	EPA, 1994	15	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	2,190	EPA, 1989	730	EPA, 1989	

TABLE 4.18

VALUES USED FOR DAILY INTAKE CALCULATIONS

Beede Waste Oil

Scenario Timeframe: Future
Medium: Soil
Medium Description: Parcel 1 and Parcel 2 soil, 0 to 1 foot
Exposure Medium: Surface Soil
Exposure Point: 0 to 1 foot soil
Receptor Population: Resident
Receptor Age: Child+

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Dermal	CS	Chemical Concentration in Soil	mg/kg	See Table 3	(3)	See Table 3	(3)	Chronic Absorbed Dose (CAD) (mg/kg-day) =
	CF1	Conversion Factor 1	kg/mg	10^{-6}	- -	10^{-6}	- -	CS x CF1 x SA x AF x ABS x EF x ED x
	SA	Skin Surface Area Available for Contact	cm^2/event	2,900	EPA, 1997	2,900	EPA, 1997	1/BW x 1/AT
	AF	Soil to Skin Adherence Factor	mg/cm^2	0.2	Holmes et al. 1999; Kissel et al. 1998	0.06	Holmes et al. 1999; Kissel et al. 1998	
	ABS	Absorption Factor	unitless	(1)	(1)	(1)	(1)	
	EF	Exposure Frequency	events/yr	160	DES, 1998, Appendix A	160	DES, 1998, Appendix A	
	ED	Exposure Duration	yrs	6	EPA, 1994	2	EPA, 1994	
	BW	Body Weight	kg	15	EPA, 1994	15	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	2,190	EPA, 1989	730	EPA, 1989	

(1) Refer to Table 4A - Dermal Absorption Efficiencies (PC and ABS)

(2) Professional Judgement

(3) Table 3.14 presents the COPC exposure point concentrations.

+ The resident - child is 0-6 years old

Sources:

DES, 1998; Contaminated Sites Risk Characterization and Management Policy, New Hampshire Department of Environmental Services. January 1998, Appendix A. p. 4.

EPA, 1989: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part A. OERR. EPA/540/189/002.

EPA, 1994: USEPA Region 1, Waste Management Division, Risk Updates. August 1994, Number 2, Attachment 2 and Attachment 3.

EPA, 1997: Exposure Factors Handbook, Volume I, Volume II, and Volume III. ORD. EPA/600/P-95/002Fc.

Holmes, K.K. Jr., Shirai, J.H., Richter, K.Y., and Kissel, J.C., 1999: Field Measurement of dermal soil loadings in occupational and recreational activities. *Environmental Research* 80:148-157.

TABLE 4.19

VALUES USED FOR DAILY INTAKE CALCULATIONS

Beede Waste Oil

Scenario Timeframe: Future
Medium: Soil
Medium Description: Parcel 1 and Parcel 2 soil, 0 to 10 feet
Exposure Medium: Particulates
Exposure Point: Fugitive Dust
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation - Dust	CA	Site-Specific or Modeled Air Concentration - Dust	mg/m^3	See Table 3	(3)	See Table 3	(3)	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR-I	Inhalation Rate	m^3/hr	3.3	EPA, 1997 (Vol.I: Table 5-23, upper percentile hourly avg for outdoor workers)	1.3	EPA, 1997 (Vol.I: Table 5-23, mean hourly avg for outdoor workers)	CA x IR x ET x EF x ED x 1/AT x 1/BW
	ET	Exposure Time	hr/day	12	95th percentile time spent at work; EPA, 1997 (Vol. III: Table 15-48)	8	50th percentile time spent at work; EPA, 1997 (Vol. III: Table 15-48)	
	EF	Exposure Frequency	days/yr	150	Five (5) non-winter months and seven (7) days per week - May - September; EPA, 1994	90	(2)	
	ED	Exposure Duration	yrs	1	(2)	1	(2)	
	BW	Body Weight	kg	70	EPA, 1994	70	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	365	EPA, 1989	365	EPA, 1989	

(1) Refer to Table 4A - Dermal Absorption Efficiencies (PC and ABS)

(2) Professional Judgement

(3) Table 3.12 presents the COPC exposure point concentrations. Refer to Table I-1 for model parameters.

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part A. OERR. EPA/540/189/002.

EPA, 1994: USEPA Region 1, Waste Management Division, Risk Updates. August 1994, Number 2, Attachment 2 and Attachment 3.

EPA, 1997: Exposure Factors Handbook, Volume I, Volume II, and Volume III. ORD. EPA/600/P-95/002Fc.

TABLE 4.20

VALUES USED FOR DAILY INTAKE CALCULATIONS

Beede Waste Oil

Scenario Timeframe: Future
Medium: Soil
Medium Description: Parcel 1 and Parcel 2 soil, 0 to 10 feet
Exposure Medium: Particulates
Exposure Point: Fugitive Dust
Receptor Population: Resident
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation - Dust	CA	Site-Specific or Modeled Air Concentration - Dust	mg/m^3	See Table 3	(3)	See Table 3	(3)	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR-I	Inhalation Rate	m^3/hr	0.55	EPA, 1997 (Vol.I: Table 5-23)	0.55	EPA, 1997 (Vol.I: Table 5-23)	CA x IR x ET x EF x ED x 1/AT x 1/BW
	ET	Exposure Time	hr/day	8	95th percentile time spent outside at residence per day; EPA, 1997 (Vol. III: Table 15-132)	2	50th percentile time spent outside at residence per day; EPA, 1997 (Vol. III: Table 15-132)	
	EF	Exposure Frequency	days/yr	160	DES, 1998, Appendix A	160	DES, 1998, Appendix A	
	ED	Exposure Duration	yrs	24	EPA, 1994	7	EPA, 1994	
	BW	Body Weight	kg	70	EPA, 1994	70	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	8,760	EPA, 1989	2,555	EPA, 1989	

(1) Refer to Table 4A - Dermal Absorption Efficiencies (PC and ABS)

(2) Professional Judgement

(3) Table 3.12 presents the COPC exposure point concentrations. Refer to Table I-1 for model parameters.

Sources:

DES, 1998; Contaminated Sites Risk Characterization and Management Policy, New Hampshire Department of Environmental Services. January 1998, Appendix A. p. 4.

EPA, 1989: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part A. OERR. EPA/540/189/002.

EPA, 1994: USEPA Region 1, Waste Management Division, Risk Updates. August 1994, Number 2, Attachment 2 and Attachment 3.

EPA, 1997: Exposure Factors Handbook, Volume I, Volume II, and Volume III. ORD. EPA/600/P-95/002Fc.

TABLE 4.21

VALUES USED FOR DAILY INTAKE CALCULATIONS

Beede Waste Oil

Scenario Timeframe: Future
Medium: Soil
Medium Description: Parcel 1 and Parcel 2 soil, 0 to 1 foot
Exposure Medium: Particulates
Exposure Point: Fugitive Dust
Receptor Population: Resident
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation - Dust	CA	Site-Specific or Modeled Air Concentration - Dust	mg/m^3	See Table 3	(3)	See Table 3	(3)	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR-I	Inhalation Rate	m^3/hr	0.55	EPA, 1997 (Vol.I: Table 5-23)	0.55	EPA, 1997 (Vol.I: Table 5-23)	CA x IR x ET x EF x ED x 1/AT x 1/BW
	ET	Exposure Time	hr/day	8	95th percentile time spent outside at residence per day; EPA, 1997 (Vol. III: Table 15-132)	2	50th percentile time spent outside at residence per day; EPA, 1997 (Vol. III: Table 15-132)	
	EF	Exposure Frequency	days/yr	160	DES, 1998, Appendix A	160	DES, 1998, Appendix A	
	ED	Exposure Duration	yrs	24	EPA, 1994	7	EPA, 1994	
	BW	Body Weight	kg	70	EPA, 1994	70	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	8,760	EPA, 1989	2,555	EPA, 1989	

(1) Refer to Table 4A - Dermal Absorption Efficiencies (PC and ABS)

(2) Professional Judgement

(3) Table 3.15 presents the COPC exposure point concentrations. Refer to Table I-1 for model parameters.

Sources:

DES, 1998; Contaminated Sites Risk Characterization and Management Policy, New Hampshire Department of Environmental Services. January 1998, Appendix A. p. 4.

EPA, 1989: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part A. OERR. EPA/540/189/002.

EPA, 1994: USEPA Region 1, Waste Management Division, Risk Updates. August 1994, Number 2, Attachment 2 and Attachment 3.

EPA, 1997: Exposure Factors Handbook, Volume I, Volume II, and Volume III. ORD. EPA/600/P-95/002Fc.

TABLE 4.22

VALUES USED FOR DAILY INTAKE CALCULATIONS

Beede Waste Oil

Scenario Timeframe: Future
Medium: Soil
Medium Description: Parcel 1 and Parcel 2 soil, 0 to 10 feet
Exposure Medium: Particulates
Exposure Point: Fugitive Dust
Receptor Population: Resident
Receptor Age: Child+

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation - Dust	CA	Site-Specific or Modeled Air Concentration - Dust	mg/m^3	See Table 3	(3)	See Table 3	(3)	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR-I	Inhalation Rate	m^3/hr	0.27	0-6 years old; EPA 1997 (Vol I: Table 5-23)	0.27	0-6 years old; EPA 1997 (Vol I: Table 5-23)	CA x IR x ET x EF x ED x 1/AT x 1/BW
	ET	Exposure Time	hr/day	9	95th percentile time spent outside at residence per day; EPA, 1997 (Vol. III: Table 15-132; 1-4 years old)	2	50th percentile time spent outside at residence per day; EPA, 1997 (Vol. III: Table 15-132; 1-4 years old)	
	EF	Exposure Frequency	days/yr	160	DES, 1998, Appendix A	160	DES, 1998, Appendix A	
	ED	Exposure Duration	yrs	6	EPA, 1994	2	EPA, 1994	
	BW	Body Weight	kg	15	EPA, 1994	15	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	2,190	EPA, 1989	730	EPA, 1989	

(1) Refer to Table 4A - Dermal Absorption Efficiencies (PC and ABS)

(2) Professional Judgement

(3) Table 3.12 presents the COPC exposure point concentrations. Refer to Table I-1 for model parameters.

+ The resident-child is 0-6 years old

Sources:

DES, 1998; Contaminated Sites Risk Characterization and Management Policy, New Hampshire Department of Environmental Services. January 1998, Appendix A. p. 4.

EPA, 1989: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part A. OERR. EPA/540/189/002.

EPA, 1994: USEPA Region 1, Waste Management Division, Risk Updates. August 1994, Number 2, Attachment 2 and Attachment 3.

EPA, 1997: Exposure Factors Handbook, Volume I, Volume II, and Volume III. ORD. EPA/600/P-95/002Fc.

TABLE 4.23

VALUES USED FOR DAILY INTAKE CALCULATIONS

Beede Waste Oil

Scenario Timeframe: Future
Medium: Soil
Medium Description: Parcel 1 and Parcel 2 soil, 0 to 1 foot
Exposure Medium: Particulates
Exposure Point: Fugitive Dust
Receptor Population: Resident
Receptor Age: Child+

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation - Dust	CA	Site-Specific or Modeled Air Concentration - Dust	mg/m^3	See Table 3	(3)	See Table 3	(3)	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR-I	Inhalation Rate	m^3/hr	0.27	0-6 years old; EPA 1997 (Vol I: Table 5-23)	0.27	0-6 years old; EPA 1997 (Vol I: Table 5-23)	CA x IR x ET x EF x ED x 1/AT x 1/BW
	ET	Exposure Time	hr/day	9	95th percentile time spent outside at residence per day; EPA, 1997 (Vol. III: Table 15-132; 1-4 years old)	2	50th percentile time spent outside at residence per day; EPA, 1997 (Vol. III: Table 15-132; 1-4 years old)	
	EF	Exposure Frequency	days/yr	160	DES, 1998, Appendix A	160	DES, 1998, Appendix A	
	ED	Exposure Duration	yrs	6	EPA, 1994	2	EPA, 1994	
	BW	Body Weight	kg	15	EPA, 1994	15	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	2,190	EPA, 1989	730	EPA, 1989	

(1) Refer to Table 4A - Dermal Absorption Efficiencies (PC and ABS)

(2) Professional Judgement

(3) Table 3.15 presents the COPC exposure point concentrations. Refer to Table I-1 for model parameters.

+ The resident-child is 0-6 years old

Sources:

DES, 1998; Contaminated Sites Risk Characterization and Management Policy, New Hampshire Department of Environmental Services. January 1998, Appendix A. p. 4.

EPA, 1989: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part A. OERR. EPA/540/189/002.

EPA, 1994: USEPA Region 1, Waste Management Division, Risk Updates. August 1994, Number 2, Attachment 2 and Attachment 3.

EPA, 1997: Exposure Factors Handbook, Volume I, Volume II, and Volume III. ORD. EPA/600/P-95/002Fc.

TABLE 4.24

VALUES USED FOR DAILY INTAKE CALCULATIONS

Beede Waste Oil

Scenario Timeframe: Future
Medium: Soil
Medium Description: Parcel 1 and Parcel 2 soil, 0 to 10 feet
Exposure Medium: Vapors
Exposure Point: Vapors from Stained Soils
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation - Vapors	CA	Site-Specific or Modeled Air Concentration - Vapors	mg/m^3	See Table 3	(3)	See Table 3	(3)	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR-I	Inhalation Rate	m^3/hr	3.3	EPA, 1997 (Vol.I: Table 5-23, upper percentile hourly avg for outdoor workers)	1.3	EPA, 1997 (Vol.I: Table 5-23, mean hourly avg for outdoor workers)	CA x IR x ET x EF x ED x 1/AT x 1/BW
	ET	Exposure Time	hr/day	12	95th percentile time spent at work; EPA, 1997 (Vol. III: Table 15-48)	8	50th percentile time spent at work; EPA, 1997 (Vol. III: Table 15-48)	
	EF	Exposure Frequency	days/yr	150	Five (5) non-winter months and seven (7) days per week - May - September; EPA, 1994	90	(2)	
	ED	Exposure Duration	yrs	1	(2)	1	(2)	
	BW	Body Weight	kg	70	EPA, 1994	70	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	365	EPA, 1989	365	EPA, 1989	

(1) Refer to Table 4A - Dermal Absorption Efficiencies (PC and ABS)

(2) Professional Judgement

(3) Table 3.13 presents the COPC exposure point concentrations. Refer to Table I-2 for model parameters.

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part A. OERR. EPA/540/189/002.

EPA, 1994: USEPA Region 1, Waste Management Division, Risk Updates. August 1994, Number 2, Attachment 2 and Attachment 3.

EPA, 1997: Exposure Factors Handbook, Volume I, Volume II, and Volume III. ORD. EPA/600/P-95/002Fc.

TABLE 4.25

VALUES USED FOR DAILY INTAKE CALCULATIONS

Beede Waste Oil

Scenario Timeframe: Future
Medium: Soil
Medium Description: Parcel 1 and Parcel 2 soil, 0 to 10 feet
Exposure Medium: Vapors
Exposure Point: Vapors from Stained Soils
Receptor Population: Resident
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation - Vapors	CA	Site-Specific or Modeled Air Concentration - Vapors	mg/m^3	See Table 3	(3)	See Table 3	(3)	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR-I	Inhalation Rate	m^3/hr	0.55	EPA, 1997 (Vol.I: Table 5-23)	0.55	EPA, 1997 (Vol.I: Table 5-23)	CA x IR x ET x EF x ED x 1/AT x 1/BW
	ET	Exposure Time	hr/day	8	95th percentile time spent outside at residence per day; EPA, 1997 (Vol. III: Table 15-132)	2	50th percentile time spent outside at residence per day; EPA, 1997 (Vol. III: Table 15-132)	
	EF	Exposure Frequency	days/yr	160	DES, 1998, Appendix A	160	DES, 1998, Appendix A	
	ED	Exposure Duration	yrs	24	EPA, 1994	7	EPA, 1994	
	BW	Body Weight	kg	70	EPA, 1994	70	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	8,760	EPA, 1989	2,555	EPA, 1989	

(1) Refer to Table 4A - Dermal Absorption Efficiencies (PC and ABS)

(2) Professional Judgement

(3) Table 3.13 presents the COPC exposure point concentrations. Refer to Table I-2 for model parameters.

Sources:

DES, 1998; Contaminated Sites Risk Characterization and Management Policy, New Hampshire Department of Environmental Services. January 1998, Appendix A. p. 4.

EPA, 1989: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part A. OERR. EPA/540/189/002.

EPA, 1994: USEPA Region 1, Waste Management Division, Risk Updates. August 1994, Number 2, Attachment 2 and Attachment 3.

EPA, 1997: Exposure Factors Handbook, Volume I, Volume II, and Volume III. ORD. EPA/600/P-95/002Fc.

TABLE 4.26

VALUES USED FOR DAILY INTAKE CALCULATIONS

Beede Waste Oil

Scenario Timeframe: Future
Medium: Soil
Medium Description: Parcel 1 and Parcel 2 soil, 0 to 1 foot
Exposure Medium: Vapors
Exposure Point: Vapors from Surface Soils
Receptor Population: Resident
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation - Vapors	CA	Site-Specific or Modeled Air Concentration - Vapors	mg/m^3	See Table 3	(3)	See Table 3	(3)	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR-I	Inhalation Rate	m^3/hr	0.55	EPA, 1997 (Vol.I: Table 5-23)	0.55	EPA, 1997 (Vol.I: Table 5-23)	CA x IR x ET x EF x ED x 1/AT x 1/BW
	ET	Exposure Time	hr/day	8	95th percentile time spent outside at residence per day; EPA, 1997 (Vol. III: Table 15-132)	2	50th percentile time spent outside at residence per day; EPA, 1997 (Vol. III: Table 15-132)	
	EF	Exposure Frequency	days/yr	160	DES, 1998, Appendix A	160	DES, 1998, Appendix A	
	ED	Exposure Duration	yrs	24	EPA, 1994	7	EPA, 1994	
	BW	Body Weight	kg	70	EPA, 1994	70	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	8,760	EPA, 1989	2,555	EPA, 1989	

(1) Refer to Table 4A - Dermal Absorption Efficiencies (PC and ABS)

(2) Professional Judgement

(3) Table 3.16 presents the COPC exposure point concentrations. Refer to Table I-2 for model parameters.

Sources:

DES, 1998; Contaminated Sites Risk Characterization and Management Policy, New Hampshire Department of Environmental Services. January 1998, Appendix A. p. 4.

EPA, 1989: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part A. OERR. EPA/540/189/002.

EPA, 1994: USEPA Region 1, Waste Management Division, Risk Updates. August 1994, Number 2, Attachment 2 and Attachment 3.

EPA, 1997: Exposure Factors Handbook, Volume I, Volume II, and Volume III. ORD. EPA/600/P-95/002Fc.

TABLE 4.27

VALUES USED FOR DAILY INTAKE CALCULATIONS

Beede Waste Oil

Scenario Timeframe: Future
Medium: Soil
Medium Description: Parcel 1 and Parcel 2 soil, 0 to 10 feet
Exposure Medium: Vapors
Exposure Point: Vapors from Stained Soils
Receptor Population: Resident
Receptor Age: Child+

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation - Vapors	CA	Site-Specific or Modeled Air Concentration - Vapors	mg/m^3	See Table 3	(3)	See Table 3	(3)	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR-I	Inhalation Rate	m^3/hr	0.27	0-6 years old; EPA 1997 (Vol I: Table 5-23)	0.27	0-6 years old; EPA 1997 (Vol I: Table 5-23)	CA x IR x ET x EF x ED x 1/AT x 1/BW
	ET	Exposure Time	hr/day	9	95th percentile time spent outside at residence per day; EPA, 1997 (Vol. III: Table 15-132; 1-4 years old)	2	50th percentile time spent outside at residence per day; EPA, 1997 (Vol. III: Table 15-132; 1-4 years old)	
	EF	Exposure Frequency	days/yr	160	DES, 1998, Appendix A	160	DES, 1998, Appendix A	
	ED	Exposure Duration	yrs	6	EPA, 1994	2	EPA, 1994	
	BW	Body Weight	kg	15	EPA, 1994	15	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	2,190	EPA, 1989	730	EPA, 1989	

(1) Refer to Table 4A - Dermal Absorption Efficiencies (PC and ABS)

(2) Professional Judgement

(3) Table 3.13 presents the COPC exposure point concentrations. Refer to Table I-2 for model parameters.

+ The resident - child is 0-6 years old

Sources:

DES, 1998; Contaminated Sites Risk Characterization and Management Policy, New Hampshire Department of Environmental Services. January 1998, Appendix A. p. 4.

EPA, 1989: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part A. OERR. EPA/540/189/002.

EPA, 1994: USEPA Region 1, Waste Management Division, Risk Updates. August 1994, Number 2, Attachment 2 and Attachment 3.

EPA, 1997: Exposure Factors Handbook, Volume I, Volume II, and Volume III. ORD. EPA/600/P-95/002Fc.

TABLE 4.28

VALUES USED FOR DAILY INTAKE CALCULATIONS

Beede Waste Oil

Scenario Timeframe: Future
Medium: Soil
Medium Description: Parcel 1 and Parcel 2 soil, 0 to 1 foot
Exposure Medium: Vapors
Exposure Point: Vapors from Surface Soils
Receptor Population: Resident
Receptor Age: Child+

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation - Vapors	CA	Site-Specific or Modeled Air Concentration - Vapors	mg/m^3	See Table 3	(3)	See Table 3	(3)	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR-I	Inhalation Rate	m^3/hr	0.27	0-6 years old; EPA 1997 (Vol I: Table 5-23)	0.27	0-6 years old; EPA 1997 (Vol I: Table 5-23)	CA x IR x ET x EF x ED x 1/AT x 1/BW
	ET	Exposure Time	hr/day	9	95th percentile time spent outside at residence per day; EPA, 1997 (Vol. III: Table 15-132; 1-4 years old)	2	50th percentile time spent outside at residence per day; EPA, 1997 (Vol. III: Table 15-132; 1-4 years old)	
	EF	Exposure Frequency	days/yr	160	DES, 1998, Appendix A	160	DES, 1998, Appendix A	
	ED	Exposure Duration	yrs	6	EPA, 1994	2	EPA, 1994	
	BW	Body Weight	kg	15	EPA, 1994	15	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	2,190	EPA, 1989	730	EPA, 1989	

(1) Refer to Table 4A - Dermal Absorption Efficiencies (PC and ABS)

(2) Professional Judgement

(3) Table 3.16 presents the COPC exposure point concentrations. Refer to Table I-2 for model parameters.

+ The resident - child is 0-6 years old

Sources:

DES, 1998; Contaminated Sites Risk Characterization and Management Policy, New Hampshire Department of Environmental Services. January 1998, Appendix A. p. 4.

EPA, 1989: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part A. OERR. EPA/540/189/002.

EPA, 1994: USEPA Region 1, Waste Management Division, Risk Updates. August 1994, Number 2, Attachment 2 and Attachment 3.

EPA, 1997: Exposure Factors Handbook, Volume I, Volume II, and Volume III. ORD. EPA/600/P-95/002Fc.

Table 4a. SUPPORTING INFORMATION
DERMAL ABSORPTION EFFICIENCIES
BEEDE WASTE OIL/CASH ENERGY SITE
PLAISTOW, NH

CAS Number	Chemical of Potential Concern (COPC)	Absorption Factor (ABS) (SOLID) (Unitless)	Reference	Permeability Constant (PC) (AQUEOUS) (cm/hr)	Reference
	Inorganics				
7440-36-0	Antimony	1.00E-02	EPA Region 1 Screening Value	1.00E-03	NA-use Cd PC
7440-38-2	Arsenic	3.00E-02	Wester et al. 1993	1.00E-03	NA-use Cd PC
7440-39-3	Barium	1.00E-02	EPA Region 1 Screening Value	1.00E-03	NA-use Cd PC
7440-41-7	Beryllium	1.00E-02	EPA Region 1 Screening Value	--	--
7440-43-9	Cadmium	1.00E-02	Wester et al. 1992; EPA 1992	1.00E-03	EPA 1992-Table 5-3; Cadmium chloride
7440-47-3	Chromium	1.00E-02	EPA Region 1 Screening Value	2.00E-03	EPA 1992-Table 5-3; Sodium chromate
7440-50-8	Copper	1.00E-02	EPA Region 1 Screening Value	--	--
7439-92-1	Lead	1.00E-02	EPA Region 1 Screening Value	4.00E-06	EPA 1992-Table 5-3; Lead acetate
7439-96-5	Manganese	1.00E-02	EPA Region 1 Screening Value	1.00E-03	NA-use Cd PC
7439-97-6	Mercury	1.00E-02	EPA Region 1 Screening Value	3.00E-03	EPA 1992-Table 5-3; Potassium Mercuric Acid
7440-02-0	Nickel	1.00E-02	EPA Region 1 Screening Value	1.00E-04	EPA 1992-Table 5-3; Nickel chloride
7782-49-2	Selenium	1.00E-02	EPA Region 1 Screening Value	1.00E-03	NA-use Cd PC
7440-28-0	Thallium	1.00E-02	EPA Region 1 Screening Value	--	--
7440-62-2	Vanadium	1.00E-02	EPA Region 1 Screening Value	--	--
7440-66-6	Zinc	1.00E-02	EPA Region 1 Screening Value	6.00E-04	EPA 1992-Table 5-3; Zinc chloride
7439-98-7	Molybdenum	1.00E-02	EPA Region 1 Screening Value	1.00E-03	NA-use Cd PC
	Nitrate-N	--	--	1.00E-03	NA-use Cd PC
	VOCs				
75-71-8	Dichlorodifluoromethane	--	--	1.20E-02	EPA 1992 - Table 58 - Estimated
74-87-3	Chloromethane	--	--	4.20E-03	EPA 1992 - Table 58 - Estimated
75-01-4	Vinyl chloride	--	--	7.30E-03	EPA 1992 - Table 58 - Estimated
75-00-3	Chloroethane	--	--	8.00E-03	EPA 1992 - Table 58 - Estimated
75-35-4	1,1-Dichloroethene	--	--	1.60E-02	EPA 1992 - Table 58 - Estimated
75-09-2	Methylene chloride	--	--	4.50E-03	EPA 1992 - Table 58 - Estimated
1634-04-4	Methyl t-butyl ether	--	--	--	--
156-60-5	trans-1,2-Dichloroethene	--	--	1.00E-02	EPA 1992 - Table 58 - Estimated
75-34-3	1,1-Dichloroethane	--	--	8.90E-03	EPA 1992 - Table 58 - Estimated
156-59-2	cis-1,2-Dichloroethene	--	--	1.00E-02	Assume same as trans isomer
71-55-6	1,1,1-Trichloroethane	--	--	1.70E-02	EPA 1992 - Table 58 - Estimated
107-06-2	1,2-Dichloroethane	--	--	5.30E-03	EPA 1992 - Table 58 - Estimated
71-43-2	Benzene	--	--	1.10E-01	EPA 1992 - Table 58 - Measured
79-01-6	Trichloroethene	--	--	2.30E-01	EPA 1992 - Table 58 - Measured
108-88-3	Toluene	--	--	1.00E+00	EPA 1992 - Table 58 - Measured
127-18-4	Tetrachloroethene	--	--	3.70E-01	EPA 1992 - Table 58 - Measured
100-41-4	Ethylbenzene	--	--	1.00E+00	EPA 1992 - Table 58 - Measured
79-34-5	1,1,2,2-Tetrachloroethane	--	--	9.00E-03	EPA 1992 - Table 58 - Estimated
103-65-1	n-Propylbenzene	--	--	1.10E-01	NA-use benzene PC
108-67-8	1,3,5-Trimethylbenzene	--	--	1.10E-01	NA-use benzene PC
98-06-6	tert-Butylbenzene	--	--	1.10E-01	NA-use benzene PC
95-63-6	1,2,4-Trimethylbenzene	--	--	1.10E-01	NA-use benzene PC
135-98-8	sec-Butylbenzene	--	--	1.10E-01	NA-use benzene PC
25155-15-1	p-Isopropyltoluene (cymene)	--	--	1.10E-01	NA-use benzene PC
104-51-8	n-Butylbenzene	--	--	1.10E-01	NA-use benzene PC
95-50-1	1,2-Dichlorobenzene	--	--	6.10E-02	EPA 1992 - Table 58 - Estimated
91-20-3	Naphthalene	--	--	6.90E-02	EPA 1992 - Table 58 - Estimated

Table 4a. SUPPORTING INFORMATION
DERMAL ABSORPTION EFFICIENCIES
BEEDE WASTE OIL/CASH ENERGY SITE
PLAISTOW, NH

CAS Number	Chemical of Potential Concern (COPC)	Absorption Factor (ABS) (SOLID) (Unitless)	Reference	Permeability Constant (PC) (AQUEOUS) (cm/hr)	Reference
	PAHs				
91-57-6	2-Methylnaphthalene	1.30E-01	Wester et al. 1990 (For Benzo(a)pyrene)	6.90E-02	NA-use naphthalene PC
208-96-8	Acenaphthylene	1.30E-01	Wester et al. 1990 (For Benzo(a)pyrene)	6.90E-02	NA-use naphthalene PC
85-01-8	Phenanthrene	1.30E-01	Wester et al. 1990 (For Benzo(a)pyrene)	2.30E-01	EPA 1992 - Table 58 - Estimated
56-55-3	Benz(a)anthracene	1.30E-01	Wester et al. 1990 (For Benzo(a)pyrene)	8.10E-01	EPA 1992 - Table 58 - Estimated
218-01-9	Chrysene	1.30E-01	Wester et al. 1990 (For Benzo(a)pyrene)	8.10E-01	EPA 1992 - Table 58 - Estimated
205-99-2	Benzo(b)fluoranthene	1.30E-01	Wester et al. 1990 (For Benzo(a)pyrene)	1.20E+00	EPA 1992 - Table 58 - Estimated
207-08-9	Benzo(k)fluoranthene	1.30E-01	Wester et al. 1990 (For Benzo(a)pyrene)	1.20E+00	NA-use benzo(b)flouranthene PC
50-32-8	Benzo(a)pyrene	1.30E-01	Wester et al. 1990 (For Benzo(a)pyrene)	1.20E+00	EPA 1992 - Table 58 - Estimated
193-39-5	Indeno(1,2,3-cd)pyrene	1.30E-01	Wester et al. 1990 (For Benzo(a)pyrene)	1.90E+00	EPA 1992 - Table 58 - Estimated
53-70-3	Dibenz(a,h,)anthracene	1.30E-01	Wester et al. 1990 (For Benzo(a)pyrene)	2.70E+00	EPA 1992 - Table 58 - Estimated
191-24-2	Benzo(g,h,i)perylene	1.30E-01	Wester et al. 1990 (For Benzo(a)pyrene)	--	--
	SVOCs				
117-81-7	bis(2-Ethylhexyl)phthalate	1.30E-01	Wester et al. 1990 (For Benzo(a)pyrene)	--	--
	Volatile Petroleum Hydrocarbons				
	C5-C8 Aliphatics	5.00E-01	MADEP 1997 - Table 4-11	1.30E-02	NA-use hexanol PC
	C9-C12 Aliphatics	2.00E-01	MADEP 1997 - Table 4-11	1.30E-02	NA-use hexanol PC
	C9-C10 Aromatics	1.80E-01	MADEP 1997 - Table 4-11	6.90E-02	NA-use naphthalene PC
	Extractable Petroleum Hydrocarbons				
	C9-C18 Aliphatics	2.00E-01	MADEP 1997 - Table 4-11	--	--
	C11-C22 Aromatics	1.80E-01	MADEP 1997 - Table 4-11	1.20E+00	NA-use benzo(a)pyrene
	Dioxin-like PCB Congeners	1.40E-01	Wester et al. 1993 (Aroclor 1254/1242)	--	--
	Total PCBs	1.40E-01	Wester et al. 1993 (Aroclor1254/1242)	--	--
	Dioxins	3.00E-02	EPA 1992	--	--
	Pesticides				
309-00-2	Aldrin	3.00E-02	Wester et al. 1990	1.60E-03	EPA 1992 - Table 58 - Estimated
319-84-6	Alpha-BHC (hexachlorocylcohexane (HCH))	--	--	2.10E-01	NA-use hexachloro benzene
58-89-9	Gamma-BHC (hexachlorocylcohexane (HCH), lindane)	--	--	2.10E-01	NA-use hexachloro benzene
76-44-8	Heptachlor	--	--	1.10E-02	EPA 1992 - Table 58 - Estimated
1024-57-3	Heptachlor epoxide	3.00E-02	Wester et al. 1990	1.10E-02	NA-use heptachlor PC
72-55-9	4,4'-DDE	3.00E-02	Wester et al. 1990	2.40E-01	EPA 1992 - Table 58 - Estimated
50-29-3	4,4'-DDT	3.00E-02	Wester et al. 1990	4.30E-01	EPA 1992 - Table 58 - Estimated
60-57-1	Dieldrin	3.00E-02	Wester et al. 1990	1.60E-02	EPA 1992 - Table 58 - Estimated
5103-73-1	Cis-nonachlor	3.00E-02	Wester et al. 1990	--	--
39765-80-5	Trans-nonachlor	3.00E-02	Wester et al. 1990	--	--

NA- Not Available

"--" indicates that this value is not needed for estimating absorbed dose because the exposure pathway is being evaluated qualitatively or because the chemical is not a COPC for the exposure pathway.

Sources:

EPA. 1992. Dermal Exposure Assessment: Principles and Applications. ORD. EPA/600/8-91/011B. January 1992.

MADEP. 1997. Characterizing Risks posed by Petroleum Contaminated Sites: Implementation of MADEP VPH/EPH Approach (Oct. 1997). Boston, MA.

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Wester, RC, et al. 1993a. In vivo and in vitro percutaneous absorption and skin decontamination of arsenic from water and soil. Fundam. Appl. Toxicol. 20:336-40.

Wester, RC, et al. 1993b. Percutaneous absorption of PCBs from soil: in vivo Rhesus monkey, in vitro human skin, and binding to powered human stratum corneum. J. Toxicol. Environ. Health 39:375-82.

Wester, RC, et al. 1993c. Percutaneous absorption of pentachlorophenol from soil. Fundam. Appl. Toxicology 20:68-71.

Wester, RC et al. 1992a. In vitro percutaneous absorption of cadmium from water and soil into human skin. Fundam. Appl. Toxicol. 19:1-5.

Wester, RC, et al. 1992b. Percutaneous absorption of [14C] chlordane from soil. J. Toxicol. Environ. Health 35:269-77.

Wester, RC, et al. 1990. Percutaneous absorption of [14C]DDT and [14C]benzo(a)pyrene from soil. Fund. Appl. Toxicology 15:510-516.

APPENDIX K

RAGS PART D TABLE 5 SERIES:

NON-CANCER TOXICITY DATA FOR COPCS

TABLE 5.1

NON-CANCER TOXICITY DATA -- ORAL/DERMAL

Beede Waste Oil/Cash Energy Site

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal RfD (2)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Source of RfD/ Target Organ	Date (3)
Volatile Organic Compounds										
Benzene	Chronic	1.0E-03	mg/kg-day	1	1.0E-03	mg/kg-day	bone marrow	1000	NCEA	09/01/98
n-Butylbenzene	Chronic	NA	mg/kg-day	1	NA	mg/kg-day	NA	NA	NA	NA
sec-Butylbenzene	Chronic	NA	mg/kg-day	1	NA	mg/kg-day	NA	NA	NA	NA
tert-Butylbenzene	Chronic	NA	mg/kg-day	1	NA	mg/kg-day	NA	NA	NA	NA
Chloroethane	Chronic	4.0E-01	mg/kg-day	1	4.0E-01	mg/kg-day	fetus	3000	NCEA	08/30/96
Chloromethane	Chronic	4.0E-03	mg/kg-day	1	4.0E-03	mg/kg-day	central nervous system	1000	NCEA	08/01/98
1,2-Dichlorobenzene	Chronic	9.0E-02	mg/kg-day	1	9.0E-02	mg/kg-day	no adverse effect	1000	IRIS	07/13/99
Dichlorodifluoromethane	Chronic	2.0E-01	mg/kg-day	1	2.0E-01	mg/kg-day	reduced body weight	100	IRIS	07/13/99
	Subchronic	9.0E-01	mg/kg-day	1	9.0E-01	mg/kg-day	no observed effect	100	HEAST	07/31/97
1,1-Dichloroethane	Chronic	1.0E-01	mg/kg-day	1	1.0E-01	mg/kg-day	no observed effect	1000	HEAST	07/31/97
	Subchronic	1.0E+00	mg/kg-day	1	1.0E+00	mg/kg-day	no observed effect	100	HEAST	07/31/97
1,2-Dichloroethane	Chronic	NA	mg/kg-day	1	NA	mg/kg-day	NA	NA	NA	NA
1,1-Dichloroethene	Chronic	9.0E-03	mg/kg-day	1	9.0E-03	mg/kg-day	liver	1000	IRIS	07/13/99
1,2-Dichloroethene (cis)	Chronic	1.0E-02	mg/kg-day	1	1.0E-02	mg/kg-day	increased serum alkaline phosphatase	3000	HEAST	07/31/97
	Subchronic	1.0E-01	mg/kg-day	1	1.0E-01	mg/kg-day	increased serum alkaline phosphatase	300	HEAST	07/31/97
1,2-Dichloroethene (trans)	Chronic	2.0E-02	mg/kg-day	1	2.0E-02	mg/kg-day	increased serum alkaline phosphatase	1000	IRIS	07/13/99
	Subchronic	2.0E-01	mg/kg-day	1	2.0E-01	mg/kg-day	increased serum alkaline phosphatase	100	HEAST	07/31/97
Ethylbenzene	Chronic	1.0E-01	mg/kg-day	1	1.0E-01	mg/kg-day	liver, kidney	1000	IRIS	07/13/99
para-Isopropyltoluene	Chronic	NA	mg/kg-day	1	NA	mg/kg-day	NA	NA	NA	NA
Methylene Chloride	Chronic	6.0E-02	mg/kg-day	1	6.0E-02	mg/kg-day	liver	100	IRIS	07/13/99
Methyl-tert-butyl ether	Chronic	NA	mg/kg-day	1	NA	mg/kg-day	NA	NA	NA	NA
n-Propylbenzene	Chronic	NA	mg/kg-day	1	NA	mg/kg-day	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	Chronic	NA	mg/kg-day	1	NA	mg/kg-day	NA	NA	NA	NA
Tetrachloroethene	Chronic	1.0E-02	mg/kg-day	1	1.0E-02	mg/kg-day	liver	1000	IRIS	07/13/99
	Subchronic	1.0E-01	mg/kg-day	1	1.0E-01	mg/kg-day	liver	100	HEAST	07/31/97
Toluene	Chronic	2.0E-01	mg/kg-day	1	2.0E-01	mg/kg-day	liver and kidney	1000	IRIS	07/13/99
	Subchronic	2.0E+00	mg/kg-day	1	2.0E+00	mg/kg-day	liver and kidney	100	HEAST	07/31/97
1,1,1-Trichloroethane	Chronic	2.0E-02	mg/kg-day	1	2.0E-02	mg/kg-day	central nervous system	3000	NCEA	08/09/96
	Subchronic	2.0E-01	mg/kg-day	1	2.0E-01	mg/kg-day	central nervous system	300	NCEA	08/09/96

TABLE 5.1

NON-CANCER TOXICITY DATA -- ORAL/DERMAL

Beede Waste Oil/Cash Energy Site

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal RfD (2)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Source of RfD/ Target Organ	Date (3)
Trichloroethene	Chronic	NA	mg/kg-day	1	NA	mg/kg-day	NA	NA	NA	NA
1,2,4-Trimethylbenzene	Chronic	NA	mg/kg-day	1	NA	mg/kg-day	NA	NA	NA	NA
1,3,5-Trimethylbenzene	Chronic	NA	mg/kg-day	1	NA	mg/kg-day	NA	NA	NA	NA
Vinyl Chloride	Chronic	5.0E-03	mg/kg-day	1	5.0E-03	mg/kg-day	liver	30	NCEA	5/1999
Petroleum Fractions										
Volatile Petroleum Hydrocarbons (VPH)										
C5-C8 aliphatics	Chronic	5.0E+00	mg/kg-day	1	5.0E+00	mg/kg-day	liver , kidney	100	TPHCWG Volume 4	1997
C9-C12 aliphatics	Chronic	1.0E-01	mg/kg-day	1	1.0E-01	mg/kg-day	liver , hematological	5000	TPHCWG Volume 4	1997
C9-C10 aromatics	Chronic	4.0E-02	mg/kg-day	1	4.0E-02	mg/kg-day	decreased body weight	10000	TPHCWG Volume 4	1997
Extractable Petroleum Hydrocarbons (EPH)										
C9-C18 aliphatics	Chronic	1.0E-01	mg/kg-day	1	1.0E-01	mg/kg-day	liver , hematological	5000	TPHCWG Volume 4	1997
C19-C36 aliphatics	Chronic	2.0E+00	mg/kg-day	1	2.0E+00	mg/kg-day	liver	100	TPHCWG Volume 4	1997
C11-C22 aromatics	Chronic	3.0E-02	mg/kg-day	1	3.0E-02	mg/kg-day	decreased body weight	3000	TPHCWG Volume 4	1997
Semivolatile Organic Compounds (SVOCs)										
Non-Carcinogenic PAHs										
Acenaphthylene	Chronic	3.0E-02	mg/kg-day	1	3.0E-02	mg/kg-day	kidney	3000	IRIS (Substitute value for pyrene)	07/13/99
Benzo(ghi)perylene	Chronic	3.0E-02	mg/kg-day	1	3.0E-02	mg/kg-day	kidney	3000	IRIS (Substitute value for pyrene)	07/13/99
2-Methylnaphthalene	Chronic	2.0E-02	mg/kg-day	1	2.0E-02	mg/kg-day	decreased body weight	3000	IRIS (Substitute value for naphthalene)	07/13/99
Naphthalene	Chronic	2.0E-02	mg/kg-day	1	2.0E-02	mg/kg-day	decreased body weight	3000	IRIS	07/13/99
Phenanthrene	Chronic	3.0E-02	mg/kg-day	1	3.0E-02	mg/kg-day	kidney	3000	IRIS (Substitute value for pyrene)	07/13/99
Carcinogenic PAHs										
Benz(a)anthracene	Chronic	NA	mg/kg-day	1	NA	mg/kg-day	NA	NA	NA	NA
Benzo(a)pyrene	Chronic	NA	mg/kg-day	1	NA	mg/kg-day	NA	NA	NA	NA
Benzo(b)fluoranthene	Chronic	NA	mg/kg-day	1	NA	mg/kg-day	NA	NA	NA	NA
Benzo(k)fluoranthene	Chronic	NA	mg/kg-day	1	NA	mg/kg-day	NA	NA	NA	NA
Chrysene	Chronic	NA	mg/kg-day	1	NA	mg/kg-day	NA	NA	NA	NA
Dibenzo(ah)anthracene	Chronic	NA	mg/kg-day	1	NA	mg/kg-day	NA	NA	NA	NA

TABLE 5.1

NON-CANCER TOXICITY DATA -- ORAL/DERMAL

Beede Waste Oil/Cash Energy Site

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal RfD (2)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Source of RfD/ Target Organ	Date (3)
Indeno(123-cd)pyrene	Chronic	NA	mg/kg-day	1	NA	mg/kg-day	NA	NA	NA	NA
Phthalates										
bis(2-Ethylhexyl)phthalate	Chronic	2.0E-02	mg/kg-day	1	2.0E-02	mg/kg-day	liver	1000	IRIS	07/13/99
	Subchronic	2.0E-02	mg/kg-day	1	2.0E-02	mg/kg-day	testicular	3000	NCEA	03/28/96
Pesticides										
Aldrin	Chronic	3.0E-05	mg/kg-day	1	3.0E-05	mg/kg-day	liver	1000	IRIS	07/13/99
alpha-HCH	Chronic	NA	mg/kg-day	1	NA	mg/kg-day	NA	NA	NA	NA
gamma-HCH (Lindane)	Chronic	3.0E-04	mg/kg-day	1	3.0E-04	mg/kg-day	liver, kidney	1000	IRIS	07/13/99
	Subchronic	3.0E-03	mg/kg-day	1	3.0E-03	mg/kg-day	liver, kidney	100	HEAST	07/31/97
4,4'-DDE	Chronic	5.0E-04	mg/kg-day	1	5.0E-04	mg/kg-day	liver	100	IRIS (substitute value for 4,4'-DDT)	07/13/99
4,4'-DDT	Chronic	5.0E-04	mg/kg-day	1	5.0E-04	mg/kg-day	liver	100	IRIS	07/13/99
Dieldrin	Chronic	5.0E-05	mg/kg-day	1	5.0E-05	mg/kg-day	liver	100	IRIS	07/13/99
Heptachlor	Chronic	5.0E-04	mg/kg-day	1	5.0E-04	mg/kg-day	liver	300	IRIS	07/13/99
Heptachlor Epoxide	Chronic	1.3E-05	mg/kg-day	1	1.3E-05	mg/kg-day	liver	1000	IRIS	07/13/99
Trans-nonachlor	Chronic	NA	mg/kg-day	1	NA	mg/kg-day	NA	NA	NA	NA
Cis-nonachlor	Chronic	NA	mg/kg-day	1	NA	mg/kg-day	NA	NA	NA	NA
Polychlorinated Biphenyls (Aroclor 1254)	Chronic	2.0E-05	mg/kg-day	1	2.0E-05	mg/kg-day	immune system	300	IRIS	07/13/99
Inorganic Compounds										
Antimony	Chronic	4.0E-04	mg/kg-day	0.1	4.0E-05	mg/kg-day	longevity, blood glucose, cholesterol	1000	IRIS	07/13/99
Arsenic (inorganic)	Chronic	3.0E-04	mg/kg-day	0.95	2.9E-04	mg/kg-day	skin, circulatory system	3	IRIS	07/13/99
Barium	Chronic	7.0E-02	mg/kg-day	0.05	3.5E-03	mg/kg-day	kidney	3	IRIS	07/13/99
Beryllium	Chronic	2.0E-03	mg/kg-day	0.01	2.0E-05	mg/kg-day	small intestine	300	IRIS	07/13/99
Cadmium (Food) (4)	Chronic	1.0E-03	mg/kg-day	0.025	2.5E-05	mg/kg-day	kidneys	10	IRIS	07/13/99
Cadmium (Water) (4)	Chronic	5.0E-04	mg/kg-day	0.05	2.5E-05	mg/kg-day	kidneys	10	IRIS	07/13/99
Chromium (VI)	Chronic	3.0E-03	mg/kg-day	0.01	3.0E-05	mg/kg-day	no observed effect	900	IRIS	07/13/99
	Subchronic	2.0E-02	mg/kg-day	0.01	2.0E-04	mg/kg-day	no observed effect	100	HEAST	07/31/97

TABLE 5.1

NON-CANCER TOXICITY DATA -- ORAL/DERMAL

Beede Waste Oil/Cash Energy Site

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal RfD (2)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Source of RfD/ Target Organ	Date (3)
Copper	Chronic	4.0E-02	mg/kg-day	0.5	2.0E-02	mg/kg-day	GI tract	NA	HEAST	10/08/96
Lead	Chronic	NA	mg/kg-day	NA	NA	mg/kg-day	central nervous system	NA	NA	NA
Manganese	Chronic	0.14 (food); 0.07 (soil); 0.024 (water)	mg/kg-day	0.05	0.007 (food); 0.0035 (soil); 0.0012 (water)	mg/kg-day	central nervous system	1 (food); 1 (soil); 3 (water)	IRIS; USEPA Region I Risk Update, Sept. 1999	7/13/1999; 9/1/99
Mercury (methyl)	Chronic	0.0001 (5)	mg/kg-day	0.07 (6)	7.0E-06	mg/kg-day	central nervous system	10	IRIS	07/13/99
Molybdenum	Chronic	5.0E-03	mg/kg-day	1	5.0E-03	mg/kg-day	uric acid levels	30	IRIS	07/13/99
Nickel (soluble salts)	Chronic	2.0E-02	mg/kg-day	0.01	2.0E-04	mg/kg-day	decreased body and organ weights	300	IRIS	07/13/99
Selenium	Chronic	5.0E-03	mg/kg-day	0.8	4.0E-03	mg/kg-day	clinical selenosis	3	IRIS	07/13/99
Thallium	Chronic	8.0E-05	mg/kg-day	1	8.0E-05	mg/kg-day	liver	3000	IRIS	07/13/99
	Subchronic	8.0E-04	mg/kg-day	1	8.0E-04	mg/kg-day	blood, liver	300	HEAST	07/31/97
Vanadium	Chronic	7.0E-03	mg/kg-day	0.02	1.4E-04	mg/kg-day	decreased hair cystine	100	HEAST	07/31/97
Zinc	Chronic	3.0E-01	mg/kg-day	0.25	7.5E-02	mg/kg-day	47% decrease in erythrocyte superoxide dismutase(ESOD) concentration	3	IRIS	07/13/99
Nitrate-N	Chronic	1.6E+00	mg/kg-day	1	1.6E+00	mg/kg-day	circulatory system	1	IRIS	07/13/99

NA= Not Available

IRIS = Integrated Risk Information System (database)

HEAST= Health Effects Assessment Summary Tables

NCEA = National Center for Environmental Assessment

TPHCWG Volume 4, 1997 = Development of Fraction Specific Reference Doses (RfDs) and Reference Concentrations (RfCs) for Total Petroleum Hydrocarbons (TPH), Volume 4, Total Petroleum Hydrocarbon Criteria Working Group Series. 1997.

(1) See discussion in RAGS, Part A
See Table 5.1a for references

(2) Dermal RfD = Oral RfD * Oral to Dermal Adjustment Factor

(3) For IRIS values, we provide the date IRIS was searched.
For HEAST values, we provide the publication date.
For NCEA values, we provide the publication date.

(4) Proposed Oral RfD = 7E-04 mg/kg-d for cadmium in food and water.
NCEA. 1999. Toxicological Review - Cadmium and Compounds In Support of Summary Information on IRIS. NCEA, Office of Research and Development, US Environmental Protection Agency, Washington, D.C. March 4, 1999.

(5) Oral RfD = 3E-04 mg/kg-d for Hg chloride; no oral RfD available for elemental Hg

(6) Oral to dermal adjustment factor is for Hg chloride. Oral to dermal adjustment factor for methyl Hg = ~1

TABLE 5.1A

ORAL TO DERMAL ADJUSTMENT FACTOR REFERENCES

Compound	Oral to Dermal Absorption Adjustment Factor Used in This Assessment	Source	Oral to Dermal Absorption Adjustment Factor From the Literature	Source
Volatile Organic Compounds				
Benzene	1	assumed	0.97	Sabourin et al. 1987
n-Butylbenzene	1	assumed	1	assumed
sec-Butylbenzene	1	assumed	1	assumed
tert-Butylbenzene	1	assumed	1	assumed
Chloroethane	1	assumed	1	assumed
Chloromethane	1	assumed	1	assumed
1,2-Dichlorobenzene	1	assumed	1	assumed
Dichlorodifluoromethane	1	assumed	1	assumed
1,1-Dichloroethane	1	assumed	1	assumed
1,2-Dichloroethane	1	assumed	0.9	Spreafico et al. 1980 (rats)
1,1-Dichloroethene	1	assumed	1	assumed
1,2-Dichloroethene (cis)	1	assumed	1	NCEA 11-1-83
1,2-Dichloroethene (trans)	1	assumed	1	NCEA 11-1-83
Ethylbenzene	1	assumed	0.92	NCEA 11-1-93
para-Isopropyltoluene	1	assumed	1	assumed
Methylene Chloride	1	assumed	1	Angelo et al. 1986
Methyl-tert-butyl ether	1	assumed	0.8	Bioresearch Labs 1990 (rats)
n-Propylbenzene	1	assumed	1	assumed
1,1,2,2-Tetrachloroethane	1	assumed	1	assumed
Tetrachloroethene	1	assumed	1	NCEA 11-1-93
Toluene	1	assumed	1	NCEA 10-9-92
1,1,1-Trichloroethane	1	assumed	1	Reitz et al 1988
Trichloroethene	1	assumed	0.9	Prout et al. 1985 (rats)
1,2,4-Trimethylbenzene	1	assumed	1	assumed
1,3,5-Trimethylbenzene	1	assumed	1	assumed
Vinyl Chloride	1	assumed	1	NCEA 11-1-93
Petroleum Fractions				
Volatile Petroleum Hydrocarbons (VPH)	1	assumed	1	assumed
C5-C8 aliphatics	1	assumed	1	assumed
C9-C12 aliphatics	1	assumed	1	assumed
C9-C10 aromatics	1	assumed	1	assumed
Extractable Petroleum Hydrocarbons (EPH)				
C9-C18 aliphatics	1	assumed	1	assumed
C19-C36 aliphatics	1	assumed	1	assumed
C11-C22 aromatics	1	assumed	1	assumed
Semivolatile Organic Compounds				
Non-Carcinogenic PAHs				
Acenaphthylene	1	assumed	0.7	ATSDR 1993
Benzo(ghi)perylene	1	assumed	1	assumed
2-Methylnaphthalene	1	assumed	0.8	Teshima et al. 1983
Naphthalene	1	assumed	0.8	Teshima et al. 1983
Phenanthrene	1	assumed	1	assumed

Compound	Oral to Dermal Absorption Adjustment Factor Used in This Assessment	Source	Oral to Dermal Absorption Adjustment Factor From the Literature	Source
Carcinogenic PAHs				
Benz(a)anthracene	1	NCEA 2-9-93	1	NCEA 2-9-93
Benzo(a)pyrene	1	NCEA 7-21-91	1	NCEA 7-21-91
Benzo(b)fluoranthene	1	NCEA 2-11-92	1	NCEA 2-11-92
Benzo(k)fluoranthene	1	assumed	1	assumed
Chrysene	1	NCEA 2-11-92	1	NCEA 2-11-92
Dibenzo(ah)anthracene	1	NCEA 12-29-92	1	NCEA 12-29-92
Indeno(123-cd)pyrene	1	NCEA 2-11-92	1	NCEA 2-11-92
Phthalates				
bis(2-Ethylhexyl)phthalate	1	assumed	0.55	ATSDR 1991
Pesticides				
Aldrin	1	assumed	1	assumed
alpha-BHC	1	assumed	1	assumed
gamma-BHC (Lindane)	1	assumed	1	assumed
4,4'-DDE	1	assumed	1	assumed
4,4'-DDT	1	assumed	1	assumed
Dieldrin	1	assumed	1	assumed
Heptachlor	1	assumed	1	assumed
Heptachlor Epoxide	1	assumed	1	assumed
trans-Nonachlor	1	assumed	1	assumed
cis-Nonachlor	1	assumed	1	assumed
Polychlorinated Biphenyls	1	assumed	1	assumed
Dioxin TEQ	1	assumed	1	assumed
Inorganic Compounds				
Antimony	0.1	Felicetti et al. 1974, Gerber et al. 1982, ICRP 1981	0.1	Felicetti et al. 1974, Gerber et al. 1982, ICRP 1981
Arsenic	0.95	Bettley 1975	0.95	Bettley 1975
Barium	0.05	ICRP 1973	0.05	ICRP 1973
Beryllium	0.01	NCEA 5-12-94	0.01	NCEA 5-12-94
Cadmium (Food)	0.025	Ellis 1979, Morgan 1984	0.025	Ellis 1979, Morgan 1984
Cadmium (Water)	0.05	McLellan 1978	0.05	McLellan 1978
Chromium III	0.01	Donaldson and Barreras 1966	0.01	Donaldson and Barreras 1966
Chromium VI (aerosols)	0.01	Donaldson and Barreras 1966, Sayto et al 1980	0.01	Donaldson and Barreras 1966, Sayto et al 1980
Chromium VI (particulates)	0.01	Donaldson and Barreras 1966, Sayto et al 1980	0.01	Donaldson and Barreras 1966, Sayto et al 1980
Copper	0.5	Strickland et al 1972	0.5	Strickland et al 1972
Lead	1	assumed	1	assumed
Manganese (food)**	0.05	Davidsson et al. 1988, 1989	0.05	Davidsson et al. 1988, 1989
Mercury	0.07	IRIS file for Mercuric Chloride (methyl mercury ~100% absorbed via GI tract)	0.07	IRIS file for Mercuric Chloride (methyl mercury ~100% absorbed via GI tract)
Molybdenum	1	assumed	1	assumed
Nickel	0.01	NCEA 6-5-92	0.01	NCEA 6-5-92
Selenium	0.02	Young 1982	0.8	Young 1982

Compound	Oral to Dermal Absorption Adjustment Factor Used in This Assessment	Source	Oral to Dermal Absorption Adjustment Factor From the Literature	Source
Thallium	1	Lie 1982	1	Lie 1982
4,4'-DDT	0.02	ATSDR 1992	0.02	ATSDR 1992
Zinc	0.25	NCEA 10-9-92	0.25	NCEA 10-9-92
Nitrate-N	1	assumed	1	assumed

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TABLE 5.2

NON-CANCER TOXICITY DATA -- INHALATION

Beede Waste Oil/Cash Energy Site

Chemical of Potential Concern	Chronic/ Subchronic	Value Inhalation RfC	Units	Adjusted Inhalation RfD (1)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfC:RfD: Target Organ	Dates (2) (MM/DD/YY)
Volatile Organic Compounds									
Benzene	Chronic	9.0E-03	mg/m^3	2.6E-03	mg/kg-day	bone marrow	1000	NCEA	9/1998
n-Butylbenzene	Chronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA
sec-Butylbenzene	Chronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA
tert-Butylbenzene	Chronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA
Chloroethane	Chronic	1.0E+01	mg/m^3	2.9E+00	mg/kg-day	fetus	300	IRIS	07/13/99
Chloromethane	Chronic	3.0E-01	mg/m^3	8.6E-02	mg/kg-day	central nervous system	100	NCEA	08/01/98
1,2-Dichlorobenzene	Chronic	2.0E-01	mg/m^3	5.7E-02	mg/kg-day	decreased body weight gain	1000	HEAST	07/31/97
	Subchronic	2.0E+00	mg/m^3	5.7E-01	mg/kg-day	decreased body weight gain	100	HEAST	07/31/97
Dichlorodifluoromethane	Chronic	2.0E-01	mg/m^3	5.7E-02	mg/kg-day	liver	10000	HEAST	07/31/97
	Subchronic	2.0E+00	mg/m^3	5.7E-01	mg/kg-day	liver	1000	HEAST	07/31/97
1,1-Dichloroethane	Chronic	5.0E-01	mg/m^3	1.4E-01	mg/kg-day	kidney	1000	HEAST	07/31/97
	Subchronic	5.0E+00	mg/m^3	1.4E+00	mg/kg-day	kidney	100	HEAST	07/31/97
1,2-Dichloroethane	Chronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA
1,1-Dichloroethene	Chronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA
1,2-Dichloroethene (cis)	Chronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA
1,2-Dichloroethene (trans)	Chronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA
Ethylbenzene	Chronic	1.0E+00	mg/m^3	2.9E-01	mg/kg-day	developmental toxicity	300	IRIS	07/13/99
para-Isopropyltoluene	Chronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA
Methylene Chloride	Chronic	3.0E+00	mg/m^3	8.6E-01	mg/kg-day	liver	100	HEAST	07/31/97
Methyl-tert-butyl ether	Chronic	3.0E+00	mg/m^3	8.6E-01	mg/kg-day	liver and kidney	100	IRIS	07/13/99
n-Propylbenzene	Chronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	Chronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA
Tetrachloroethene	Chronic	6.0E-01	mg/m^3	1.7E-01	mg/kg-day	kidney, liver, central nervous system	30	NCEA	06/20/97
Toluene	Chronic	4.0E-01	mg/m^3	1.1E-01	mg/kg-day	neurological; nasal epithelium	300	IRIS	07/13/99

TABLE 5.2

NON-CANCER TOXICITY DATA -- INHALATION

Beede Waste Oil/Cash Energy Site

Chemical of Potential Concern	Chronic/ Subchronic	Value Inhalation RfC	Units	Adjusted Inhalation RfD (1)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfC:RfD: Target Organ	Dates (2) (MM/DD/YY)
1,1,1-Trichloroethane	Chronic	1.0E+00	mg/m^3	2.9E-01	mg/kg-day	central nervous system	300	NCEA	08/09/96
	Subchronic	1.0E+01	mg/m^3	2.9E+00	mg/kg-day	central nervous system	30	NCEA (subchronic study)	08/09/96
Trichloroethene	Chronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA
1,2,4-Trimethylbenzene	Chronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA
1,3,5-Trimethylbenzene	Chronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA
Vinyl Chloride	Chronic	1.0E-01	mg/m^3	2.9E-02	mg/kg-day	liver	30	NCEA	05/01/99
Petroleum Fractions									
Volatile Petroleum Hydrocarbons (VPH)									
C5-C8 aliphatics	Chronic	1.8E+01	mg/m^3	5.3E+00	mg/kg-day	neurotoxicity	100	TPHCWG Volume 4	1997
C9-C12 aliphatics	Chronic	1.0E+00	mg/m^3	2.9E-01	mg/kg-day	liver, hematological	1000	TPHCWG Volume 4	1997
C9-C10 aromatics	Chronic	2.0E-01	mg/m^3	5.7E-02	mg/kg-day	decreased body weight	1000	TPHCWG Volume 4	1997
Extractable Petroleum Hydrocarbons (EPH)									
C9-C18 aliphatics	Chronic	1.0E+00	mg/m^3	2.9E-01	mg/kg-day	liver, hematological	1000	TPHCWG Volume 4	1997
C19-C36 aliphatics	Chronic	NA	mg/m^3	NA	mg/kg-day	liver	NA	TPHCWG Volume 4	1997
C11-C22 aromatics	Chronic	2.0E-01	mg/m^3	5.7E-02	mg/kg-day	decreased body weight	1000	TPHCWG Volume 4	1997
Semivolatile Organic Compounds									
Non-Carcinogenic PAHs									
Acenaphthylene	Chronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA
Benzo(ghi)perylene	Chronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA
2-Methylnaphthalene	Chronic	3.0E-03	mg/m^3	8.6E-04	mg/kg-day	respiratory and olfactory epithelium	3000	IRIS (Substitute value for naphthalene)	07/13/99
	Subchronic	3.0E-03	mg/m^3	8.6E-04	mg/kg-day	respiratory and olfactory epithelium	3000	IRIS (Substitute value for naphthalene)	07/13/99

TABLE 5.2

NON-CANCER TOXICITY DATA -- INHALATION

Beede Waste Oil/Cash Energy Site

Chemical of Potential Concern	Chronic/ Subchronic	Value Inhalation RfC	Units	Adjusted Inhalation RfD (1)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfC:RfD: Target Organ	Dates (2) (MM/DD/YY)
Naphthalene	Chronic	3.0E-03	mg/m^3	8.6E-04	mg/kg-day	respiratory and olfactory epithelium	3000	IRIS	07/13/99
Phenanthrene	Chronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA
Carcinogenic PAHs									
Benz(a)anthracene	Chronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA
Benzo(a)pyrene	Chronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA
Benzo(b)fluoranthene	Chronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA
Benzo(k)fluoranthene	Chronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA
Chrysene	Chronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA
Dibenzo(ah)anthracene	Chronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	IRIS (substitute value for 4,4'-DDT)	NA
4,4'-DDT	Chronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA
Phthalates									
bis(2-Ethylhexyl)phthalate	Chronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA
	Subchronic	1.0E-02	mg/m^3	2.9E-03	mg/kg-day	lungs	1000	NCEA	03/18/96
Pesticides									
Aldrin	Chronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA
alpha-BHC	Chronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA
gamma-BHC (Lindane)	Chronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA
4,4'-DDE	Chronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA
4,4'-DDT	Chronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA
Dieldrin	Chronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA
Endrin Ketone	Chronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA
Heptachlor	Chronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA

TABLE 5.2

NON-CANCER TOXICITY DATA -- INHALATION

Beede Waste Oil/Cash Energy Site

Chemical of Potential Concern	Chronic/ Subchronic	Value Inhalation RfC	Units	Adjusted Inhalation RfD (1)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfC:RfD: Target Organ	Dates (2) (MM/DD/YY)
Heptachlor Epoxide	Chronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA
cis-nonachlor	Chronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA
trans-nonachlor	Chronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA
Polychlorinated Biphenyls	Chronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA
Inorganic Compounds									
Antimony (trioxide)	Chronic	2.0E-04	mg/m^3	5.7E-05	mg/kg-day	lung	300	IRIS	07/13/99
Arsenic	Chronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA
Barium	Chronic	5.0E-04	mg/m^3	1.4E-04	mg/kg-day	fetus	1000	HEAST	07/31/97
	Subchronic	5.0E-03	mg/m^3	1.4E-03	mg/kg-day	fetus	100	HEAST	07/31/97
Beryllium	Chronic	2.0E-05	mg/m^3	5.7E-06	mg/kg-day	lung	10	IRIS	07/13/99
Cadmium	Chronic	NA (3)	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA
	Subchronic	NA (4)	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA
Chromium (VI) particulates	Chronic	1.0E-04	mg/m^3	2.9E-05	mg/kg-day	respiratory system	300	IRIS	07/13/99
Copper	Chronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA
Lead	Chronic	NA	mg/kg-day	NA	mg/kg-day	central nervous system	NA	NA	NA
Manganese	Chronic	5.0E-05	mg/m^3	1.4E-05	mg/kg-day	central nervous system	1000	IRIS	07/13/99
Mercury (elemental)	Chronic	3.0E-04	mg/m^3	8.6E-05	mg/kg-day	central nervous system	30	IRIS	07/13/99
Molybdenum	Chronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA
Nickel (soluble salts)	Chronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA
Selenium	Chronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA

TABLE 5.2

NON-CANCER TOXICITY DATA -- INHALATION

Beede Waste Oil/Cash Energy Site

Chemical of Potential Concern	Chronic/ Subchronic	Value Inhalation RfC	Units	Adjusted Inhalation RfD (1)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfC:RfD: Target Organ	Dates (2) (MM/DD/YY)
Thallium	Chronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA
Vanadium	Chronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA
Zinc	Chronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA
N-Nitrate	Chronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA

NA = Not Available

IRIS = Integrated Risk Information System (database)

HEAST= Health Effects Assessment Summary Tables

NCEA = National Center for Environmental Assessment

TPHCWG Volume 4, 1997 = Development of Fraction Specific Reference Doses (RfDs) and Reference Concentrations (RfCs) for Total Petroleum Hydrocarbons (TPH), Volume 4, Total Petroleum Hydrocarbon Criteria Working Group Series. 1997.

(1) Inhalation RfD (mg/kg-day) = Inhalation RfC (mg/m^3) * inhalation rate (20 m^3/day)/ bodyweight (70 kg).

(2) For IRIS values, we provided the data IRIS was last searched.

For HEAST values, we provided the publication date.

For NCEA values, we provided the publication date.

(3) Proposed Chronic inhalation RfC = 7E-04 mg/m^3 for cadmium in food and water

NCEA. 1999. Toxicological Review - Cadmium and Compounds In Support of Summary Information on IRIS. NCEA, Office of Research and Development, US Environmental Protection Agency, Washington, D.C. March 4, 1999.

(4) Subchronic inhalation RfC = 9E-04 mg/m^3 for both food and water

NCEA. 1996. Risk Assessment Issue Paper for: Derivation of a Provisional Subchronic RfC for Cadmium. 96-015 / 03-20-96.

APPENDIX L

RAGS PART D TABLE 6 SERIES:

CANCER TOXICITY DATA FOR COPCS

TABLE 6.1

CANCER TOXICITY DATA -- ORAL/DERMAL

Beede Waste Oil/Cash Energy Site

Chemical of Potential Concern	Oral Cancer Slope Factor	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal Cancer Slope Factor (2)	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date (3) MM/DD/YY
Volatile Organic Compounds							
Benzene	0.029 (4)	1	3.0E-02	$(mg/kg\text{-}day)^{-1}$	A	IRIS	07/13/99
n-Butylbenzene	NA	1	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA	NA
sec-Butylbenzene	NA	1	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA	NA
tert-Butylbenzene	NA	1	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA	NA
Chloroethane	NA	1	NA	$(mg/kg\text{-}day)^{-1}$	NA	IRIS	07/13/99
Chloromethane	1.3E-02	1	1.3E-02	$(mg/kg\text{-}day)^{-1}$	C	HEAST	07/31/97
1,2-Dichlorobenzene	NA	1	NA	$(mg/kg\text{-}day)^{-1}$	D	IRIS	07/13/99
Dichlorodifluoromethane	NA	1	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA	NA
1,1-Dichloroethane	NA	1	NA	$(mg/kg\text{-}day)^{-1}$	C	IRIS	07/13/99
1,2-Dichloroethane	9.1E-02	1	9.1E-02	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	07/13/99
1,1-Dichloroethene	6.0E-01	1	6.0E-01	$(mg/kg\text{-}day)^{-1}$	C	IRIS	07/13/99
1,2-Dichloroethene (cis)	NA	1	NA	$(mg/kg\text{-}day)^{-1}$	D	IRIS	07/13/99
1,2-Dichloroethene (trans)	NA	1	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA	NA
Ethylbenzene	NA	1	NA	$(mg/kg\text{-}day)^{-1}$	D	IRIS	07/13/99
para-Isopropyltoluene	NA	1	NA	$(mg/kg\text{-}day)^{-1}$	D	NCEA	06/05/97
Methylene Chloride	7.5E-03	1	7.5E-03	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	07/13/99
Methyl-tert-butyl ether	NA	1	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA	NA
n-Propylbenzene	NA	1	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA	NA
1,1,2,2-Tetrachloroethane	2.0E-01	1	2.0E-01	$(mg/kg\text{-}day)^{-1}$	C	IRIS	07/13/99
Tetrachloroethene	5.2E-02	1	5.2E-02	$(mg/kg\text{-}day)^{-1}$	NA	NCEA	06/20/97
Toluene	NA	1	NA	$(mg/kg\text{-}day)^{-1}$	D	IRIS	07/13/99
1,1,1-Trichloroethane	NA	1	NA	$(mg/kg\text{-}day)^{-1}$	D	IRIS	07/13/99
Trichloroethene	1.1E-02	1	1.1E-02	$(mg/kg\text{-}day)^{-1}$	NA	NCEA	1997
1,2,4-Trimethylbenzene	NA	1	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA	NA
1,3,5-Trimethylbenzene	NA	1	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA	NA
Vinyl Chloride	2.5E+00	1	2.5E+00	$(mg/kg\text{-}day)^{-1}$	A/ known carcinogen	NCEA	05/01/99

TABLE 6.1

CANCER TOXICITY DATA -- ORAL/DERMAL

Beede Waste Oil/Cash Energy Site

Chemical of Potential Concern	Oral Cancer Slope Factor	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal Cancer Slope Factor (2)	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date (3) MM/DD/YY
Petroleum Fractions							
Volatile Petroleum Hydrocarbons (VPH)							
C5-C8 aliphatics	NA	1	NA	NA	NA	NA	NA
C9-C12 aliphatics	NA	1	NA	NA	NA	NA	NA
C9-C10 aromatics	NA	1	NA	NA	NA	NA	NA
Extractable Petroleum Hydrocarbons (EPH)							
C9-C18 aliphatics	NA	1	NA	NA	NA	NA	NA
C19-C36 aliphatics	NA	1	NA	NA	NA	NA	NA
C11-C22 aromatics	NA	1	NA	NA	NA	NA	NA
Semivolatile Organic Compounds							
Non-Carcinogenic PAHs							
Acenaphthylene	NA	1	NA	$(mg/kg\text{-}day)^{-1}$	D	IRIS	07/13/99
Benzo(ghi)perylene	NA	1	NA	$(mg/kg\text{-}day)^{-1}$	D	IRIS	07/13/99
2-Methylnaphthalene	NA	1	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA	NA
Naphthalene	NA	1	NA	$(mg/kg\text{-}day)^{-1}$	C	IRIS	07/13/99
Phenanthrene	NA	1	NA	$(mg/kg\text{-}day)^{-1}$	D	IRIS	07/13/99
Carcinogenic PAHs (5)							
Benzo(a)anthracene	7.3E-01	1	7.3E-01	$(mg/kg\text{-}day)^{-1}$	B2	US EPA	1993
Benzo(a)pyrene	7.3E+00	1	7.3E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	07/13/99
Benzo(b)fluoranthene	7.3E-01	1	7.3E-01	$(mg/kg\text{-}day)^{-1}$	B2	US EPA	1993
Benzo(k)fluoranthene	7.3E-02	1	7.3E-02	$(mg/kg\text{-}day)^{-1}$	B2	US EPA	1993
Chrysene	7.3E-03	1	7.3E-03	$(mg/kg\text{-}day)^{-1}$	B2	US EPA	1993
Dibenzo(ah)anthracene	7.3E+00	1	7.3E+00	$(mg/kg\text{-}day)^{-1}$	B2	US EPA	1993
Indeno(123-cd)pyrene	7.3E-01	1	7.3E-01	$(mg/kg\text{-}day)^{-1}$	B2	US EPA	1993
Phthalates							
bis(2-Ethylhexyl)phthalate	1.4E-02	1	2.5E-02	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	07/13/99

TABLE 6.1

CANCER TOXICITY DATA -- ORAL/DERMAL

Beede Waste Oil/Cash Energy Site

Chemical of Potential Concern	Oral Cancer Slope Factor	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal Cancer Slope Factor (2)	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date (3) MM/DD/YY
Pesticides							
Aldrin	1.7E+01	1	1.7E+01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	07/13/99
alpha-BHC	6.3E+00	1	6.3E+00	$(mg/kg\text{-}day)^{-1}$	NA	IRIS	07/13/99
gamma-BHC (Lindane)	1.3E+00	1	1.3E+00	$(mg/kg\text{-}day)^{-1}$	B2-C	HEAST	07/31/97
4,4'-DDE	3.4E-01	1	3.4E-01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	07/13/99
4,4'-DDT	3.4E-01	1	3.4E-01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	07/13/99
Dieldrin	1.6E+01	1	1.6E+01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	07/13/99
Heptachlor	4.5E+00	1	4.5E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	07/13/99
Heptachlor Epoxide	9.1E+00	1	9.1E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	07/13/99
cis-nonachlor	NA	NA	NA	NA	NA	NA	NA
trans-nonachlor	NA	NA	NA	NA	NA	NA	NA
Polychlorinated Biphenyls							
Soil and fish ingestion (upper-bound)	2.0E+00	1	2.0E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	05/09/99
Soil and fish ingestion (central-estimate)	1.0E+00	1	1.0E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	05/09/99
Water ingestion and air inhalation (upper-bound)	4.0E-01	1	4.0E-01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	05/09/99
Water ingestion and air inhalation (central-estimate)	3.0E-01	1	3.0E-01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	05/09/99
Dioxin TEQ (6)							
2,3,7,8-TCDD (7)	1.5E+05	1	1.5E+05	$(mg/kg\text{-}day)^{-1}$	B2	HEAST	07/31/97
1,2,3,7,8-PeCDD	1.5E+05	1	1.5E+05	$(mg/kg\text{-}day)^{-1}$	B2	Van den Berg et al.	1998
1,2,3,4,7,8-HxCDD	1.5E+04	1	1.5E+04	$(mg/kg\text{-}day)^{-1}$	B2	Van den Berg et al.	1998
1,2,3,6,7,8-HxCDD	1.5E+04	1	1.5E+04	$(mg/kg\text{-}day)^{-1}$	B2	Van den Berg et al.	1998
1,2,3,7,8,9-HxCDD	1.5E+04	1	1.5E+04	$(mg/kg\text{-}day)^{-1}$	B2	Van den Berg et al.	1998
1,2,3,4,6,7,8-HpCDD	1.5E+03	1	1.5E+03	$(mg/kg\text{-}day)^{-1}$	B2	Van den Berg et al.	1998
OCDD	1.5E+01	1	1.5E+01	$(mg/kg\text{-}day)^{-1}$	B2	Van den Berg et al.	1998
2,3,7,8-TCDF	1.5E+04	1	1.5E+04	$(mg/kg\text{-}day)^{-1}$	B2	Van den Berg et al.	1998
1,2,3,7,8-PeCDF	7.5E+03	1	7.5E+03	$(mg/kg\text{-}day)^{-1}$	B2	Van den Berg et al.	1998

TABLE 6.1

CANCER TOXICITY DATA -- ORAL/DERMAL

Beede Waste Oil/Cash Energy Site

Chemical of Potential Concern	Oral Cancer Slope Factor	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal Cancer Slope Factor (2)	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date (3) MM/DD/YY
2,3,4,7,8-PeCDF	7.5E+04	1	7.5E+04	$(mg/kg\text{-}day)^{-1}$	B2	Van den Berg et al.	1998
1,2,3,4,7,8-HxCDF	1.5E+04	1	1.5E+04	$(mg/kg\text{-}day)^{-1}$	B2	Van den Berg et al.	1998
1,2,3,6,7,8-HxCDF	1.5E+04	1	1.5E+04	$(mg/kg\text{-}day)^{-1}$	B2	Van den Berg et al.	1998
1,2,3,7,8,9-HxCDF	1.5E+04	1	1.5E+04	$(mg/kg\text{-}day)^{-1}$	B2	Van den Berg et al.	1998
2,3,4,6,7,8-HxCDF	1.5E+04	1	1.5E+04	$(mg/kg\text{-}day)^{-1}$	B2	Van den Berg et al.	1998
1,2,3,4,6,7,8-HpCDF	1.5E+03	1	1.5E+03	$(mg/kg\text{-}day)^{-1}$	B2	Van den Berg et al.	1998
1,2,3,4,7,8,9-HpCDF	1.5E+03	1	1.5E+03	$(mg/kg\text{-}day)^{-1}$	B2	Van den Berg et al.	1998
OCDF	1.5E+01	1	1.5E+01	$(mg/kg\text{-}day)^{-1}$	B2	Van den Berg et al.	1998
PCB-77	1.5E+01	1	1.5E+01	$(mg/kg\text{-}day)^{-1}$	B2	Van den Berg et al.	1998
PCB-81	1.5E+01	1	1.5E+01	$(mg/kg\text{-}day)^{-1}$	B2	Van den Berg et al.	1998
PCB-118	1.5E+01	1	1.5E+01	$(mg/kg\text{-}day)^{-1}$	B2	Van den Berg et al.	1998
PCB-123	1.5E+01	1	1.5E+01	$(mg/kg\text{-}day)^{-1}$	B2	Van den Berg et al.	1998
PCB-105	1.5E+01	1	1.5E+01	$(mg/kg\text{-}day)^{-1}$	B2	Van den Berg et al.	1998
PCB-114	7.5E+01	1	7.5E+01	$(mg/kg\text{-}day)^{-1}$	B2	Van den Berg et al.	1998
PCB-126	1.5E+04	1	1.5E+04	$(mg/kg\text{-}day)^{-1}$	B2	Van den Berg et al.	1998
PCB-128/167	1.5E+00	1	1.5E+00	$(mg/kg\text{-}day)^{-1}$	B2	Van den Berg et al.	1998
PCB-156	7.5E+01	1	7.5E+01	$(mg/kg\text{-}day)^{-1}$	B2	Van den Berg et al.	1998
PCB-157	7.5E+01	1	7.5E+01	$(mg/kg\text{-}day)^{-1}$	B2	Van den Berg et al.	1998
PCB-169	1.5E+03	1	1.5E+03	$(mg/kg\text{-}day)^{-1}$	B2	Van den Berg et al.	1998
PCB-189	1.5E+01	1	1.5E+01	$(mg/kg\text{-}day)^{-1}$	B2	Van den Berg et al.	1998
Inorganic Compounds							
Antimony	NA	0.1	NA	$(mg/kg\text{-}day)^{-1}$	NA	IRIS	07/13/99
Arsenic	1.5E+00	0.95	1.6E+00	$(mg/kg\text{-}day)^{-1}$	A	IRIS	07/13/99
Barium	NA	0.05	NA	$(mg/kg\text{-}day)^{-1}$	D	IRIS	07/13/99
Beryllium	NA	0.01	NA	$(mg/kg\text{-}day)^{-1}$	B1	IRIS-Withdrawn	07/13/99
Cadmium (Food)	NA	0.025	NA	$(mg/kg\text{-}day)^{-1}$	B1	IRIS	07/13/99
Chromium III	NA	0.01	NA	$(mg/kg\text{-}day)^{-1}$	D	IRIS	NA
Chromium VI	NA	0.01	NA	$(mg/kg\text{-}day)^{-1}$	D	IRIS	NA

TABLE 6.1

CANCER TOXICITY DATA -- ORAL/DERMAL

Beede Waste Oil/Cash Energy Site

Chemical of Potential Concern	Oral Cancer Slope Factor	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal Cancer Slope Factor (2)	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date (3) MM/DD/YY
Chromium (VI)	NA	0.01	NA	$(mg/kg\text{-}day)^{-1}$	D	IRIS	07/13/99
Copper	NA	0.5	NA	$(mg/kg\text{-}day)^{-1}$	D	IRIS	07/13/99
Lead	NA	NA	NA	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	07/13/99
Manganese	NA	0.05	NA	$(mg/kg\text{-}day)^{-1}$	D	IRIS	07/13/99
Mercury	NA	0.15	NA	$(mg/kg\text{-}day)^{-1}$	C (8)	IRIS	07/13/99
Molybdenum	NA	NA	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA	NA
Nickel (soluble salts)	NA	0.01	NA	$(mg/kg\text{-}day)^{-1}$	NA	IRIS	07/13/99
Selenium	NA	0.9	NA	$(mg/kg\text{-}day)^{-1}$	D (9)	IRIS	07/13/99
Thallium	NA	1	NA	$(mg/kg\text{-}day)^{-1}$	D	NA	07/13/99
Vanadium	NA	0.02	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA	NA
Zinc	NA	0.26	NA	$(mg/kg\text{-}day)^{-1}$	D	IRIS	07/13/99
N-Nitrate	NA	NA	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA	07/13/99

NA = Not Available

IRIS = Integrated Risk Information System (database)

HEAST= Health Effects Assessment Summary Tables

NCEA= National Center for Environmental Assessment

EPA Class:

A - Human carcinogen

B1 - Probable human carcinogen - indicates that limited human data are available

B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans

C - Possible human carcinogen

D - Not classifiable as a human carcinogen

TABLE 6.1

CANCER TOXICITY DATA -- ORAL/DERMAL

Beede Waste Oil/Cash Energy Site

Chemical of Potential Concern	Oral Cancer Slope Factor	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal Cancer Slope Factor (2)	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date (3) MM/DD/YY

(1) See Table 5.1a for references

(2) Dermal Cancer Slope Factor (CSF) = Oral CSF * Oral to Dermal Adjustment Factor

(3) For IRIS values, we provided the date IRIS was last searched.

For HEAST values, we provided the date of publication.

For NCEA values, we provided the date of publication.

Weight of Evidence:

Known/Likely

Cannot be Determined

Not Likely

(4) Proposed oral cancer slope factor = 5.45E-02 $(mg/kg\text{-}d)^{-1}$.

NCEA. 1999. Extrapolation of the Benzene Inhalation Unit Risk Estimate to the Oral Route of Exposure. NCEA, Office of Research and Development, US Environmental Protection Agency, Washington, D.C. April 1999.

(5) Cancer slope factors are expressed as the CSF for benzo(a)pyrene multiplied by a relative potency factor, as described in USEPA, 1993. Provisional Guidance for Quantitative Risk Assessment of Polycyclic Aromatic Hydrocarbons. EPA/600/-3/089.

(6) Cancer slope factors are expressed as the CSF for 2,3,7,8-TCDD multiplied by a toxic equivalency factor (or TEF), as described in Van den Berg et al., 1998. Toxic Equivalency Factors (TEFs) for PCBs, PCDDs, PCDFs, for Humans and Wildlife. *Environmental Health Perspectives*, vol. 106, no. 12. December 1998.

(7) 2,3,7,8-TCDD is classified by the WHO's International Agency for Research on Cancer as a known human carcinogen.

IARC. 1999. Polychlorinated dibenzo-para- dioxins. IARC Monographs Database on Carcinogenic Risks to Humans. (http://www.iarc.fr)

(8) Weight of evidence/cancer guideline description is for methylmercury and mercuric chloride; weight of evidence classification for elemental mercury = D

(9) Weight of evidence classification for Se sulfide is B2, but no quantified slope factor.

TABLE 6.2

CANCER TOXICITY DATA -- INHALATION

Beede Waste Oil/Cash Energy Site

Chemical of Potential Concern	Unit Risk	Units	Adjustment(1)	Inhalation Cancer Slope Factor	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date (2) (MM/DD/YY)
Volatile Organic Compounds								
Benzene	7.8E-06	$(ug/m^3)^{-1}$	3500	2.7E-02	mg/kg-day	A	IRIS	7/13/99
n-Butylbenzene	NA	$(ug/m^3)^{-1}$	3500	NA	mg/kg-day	NA	NA	NA
sec-Butylbenzene	NA	$(ug/m^3)^{-1}$	3500	NA	mg/kg-day	NA	NA	NA
tert-Butylbenzene	NA	$(ug/m^3)^{-1}$	3500	NA	mg/kg-day	NA	NA	NA
Chloroethane	NA	$(ug/m^3)^{-1}$	3500	NA	mg/kg-day	B2	IRIS	7/13/99
Chloromethane	1.1E-06	$(ug/m^3)^{-1}$	3500	3.9E-03	mg/kg-day	C	NCEA	7/25/96
1,2-Dichlorobenzene	NA	$(ug/m^3)^{-1}$	3500	NA	mg/kg-day	D	IRIS	7/13/99
Dichlorodifluoromethane	NA	$(ug/m^3)^{-1}$	3500	NA	mg/kg-day	NA	NA	NA
1,1-Dichloroethane	NA	$(ug/m^3)^{-1}$	3500	NA	mg/kg-day	C	IRIS	7/13/99
1,2-Dichloroethane	2.6E-05	$(ug/m^3)^{-1}$	3500	9.1E-02	mg/kg-day	B2	IRIS -Do not use if [air] exceeds 400 ug/m^3	7/13/99
1,1-Dichloroethene	5.0E-05	$(ug/m^3)^{-1}$	3500	1.8E-01	mg/kg-day	C	IRIS -Do not use if [air] exceeds 200 ug/m^3	7/13/99
1,2-Dichloroethene (cis)	NA	$(ug/m^3)^{-1}$	3500	NA	mg/kg-day	D	IRIS	7/13/99
1,2-Dichloroethene (trans)	NA	$(ug/m^3)^{-1}$	3500	NA	mg/kg-day	NA	NA	NA
Ethylbenzene	NA	$(ug/m^3)^{-1}$	3500	NA	mg/kg-day	D	IRIS	7/13/99
para-Isopropyltoluene	NA	$(ug/m^3)^{-1}$	3500	NA	mg/kg-day	D	NCEA	6/5/97
Methylene Chloride	4.7E-07	$(ug/m^3)^{-1}$	3500	1.6E-03	mg/kg-day	B2	IRIS -Do not use if [air] exceeds 20,000 ug/m^3	7/13/99
Methyl-tert-butyl ether	NA	$(ug/m^3)^{-1}$	3500	NA	mg/kg-day	NA	NA	NA
n-Propylbenzene	NA	$(ug/m^3)^{-1}$	3500	NA	mg/kg-day	NA	NA	NA
1,1,2,2-Tetrachloroethane	5.8E-05	$(ug/m^3)^{-1}$	3500	2.0E-01	mg/kg-day	C	IRIS -Do not use if [air] exceeds 200 ug/m^3	7/13/99

TABLE 6.2

CANCER TOXICITY DATA -- INHALATION

Beede Waste Oil/Cash Energy Site

Chemical of Potential Concern	Unit Risk	Units	Adjustment(1)	Inhalation Cancer Slope Factor	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date (2) (MM/DD/YY)
Tetrachloroethene	5.8E-07	$(ug/m^3)^{-1}$	3500	2.0E-03	mg/kg-day	NA	NCEA	6/20/97
Toluene	NA	$(ug/m^3)^{-1}$	3500	NA	mg/kg-day	D	IRIS	7/13/99
1,1,1-Trichloroethane	NA	$(ug/m^3)^{-1}$	3500	NA	mg/kg-day	D	IRIS	7/13/99
Trichloroethene	1.7E-06	$(ug/m^3)^{-1}$	3500	6.0E-03	mg/kg-day	NA	NCEA	NA
1,2,4-Trimethylbenzene	NA	$(ug/m^3)^{-1}$	3500	NA	mg/kg-day	NA	NA	NA
1,3,5-Trimethylbenzene	NA	$(ug/m^3)^{-1}$	3500	NA	mg/kg-day	NA	NA	NA
Vinyl Chloride	8.7E-06	$(ug/m^3)^{-1}$	3500	3.0E-02	mg/kg-day	A / known carcinogen	NCEA	5/1999
Petroleum Fractions								
Volatile Petroleum Hydrocarbons (VPH)								
C5-C8 aliphatics	NA	$(ug/m^3)^{-1}$	3500	NA	mg/kg-day	NA	NA	NA
C9-C12 aliphatics	NA	$(ug/m^3)^{-1}$	3500	NA	mg/kg-day	NA	NA	NA
C9-C10 aromatics	NA	$(ug/m^3)^{-1}$	3500	NA	mg/kg-day	NA	NA	NA
Extractable Petroleum Hydrocarbons (EPH)			3500					
C9-C18 aliphatics	NA	$(ug/m^3)^{-1}$	3500	NA	mg/kg-day	NA	NA	NA
C19-C36 aliphatics	NA	$(ug/m^3)^{-1}$	3500	NA	mg/kg-day	NA	NA	NA
C11-C22 aromatics	NA	$(ug/m^3)^{-1}$	3500	NA	mg/kg-day	NA	NA	NA
Semivolatile Organic Compounds								
Non-Carcinogenic PAHs								
Acenaphthylene	NA	$(ug/m^3)^{-1}$	3500	NA	mg/kg-day	D	IRIS	7/13/99
Benzo(ghi)perylene	NA	$(ug/m^3)^{-1}$	3500	NA	mg/kg-day	D	IRIS	7/13/99
2-Methylnaphthalene	NA	$(ug/m^3)^{-1}$	3500	NA	mg/kg-day	NA	NA	NA
Naphthalene	NA	$(ug/m^3)^{-1}$	3500	NA	mg/kg-day	C	IRIS	7/13/99
Phenanthrene	NA	$(ug/m^3)^{-1}$	3500	NA	mg/kg-day	D	IRIS	7/13/99

TABLE 6.2

CANCER TOXICITY DATA -- INHALATION

Beede Waste Oil/Cash Energy Site

Chemical of Potential Concern	Unit Risk	Units	Adjustment(1)	Inhalation Cancer Slope Factor	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date (2) (MM/DD/YY)
Carcinogenic PAHs (3)								
Benz(a)anthracene	NA	$(ug/m^3)^{-1}$	3500	3.1E-01	mg/kg-day	B2	US EPA	1993
Benzo(a)pyrene	NA	$(ug/m^3)^{-1}$	3500	3.1E+00	mg/kg-day	B2	NCEA	11/18/94
Benzo(b)fluoranthene	NA	$(ug/m^3)^{-1}$	3500	3.1E-01	mg/kg-day	B2	US EPA	1993
Benzo(k)fluoranthene	NA	$(ug/m^3)^{-1}$	3500	3.1E-02	mg/kg-day	B2	US EPA	1993
Chrysene	NA	$(ug/m^3)^{-1}$	3500	3.1E-03	mg/kg-day	B2	US EPA	1993
Dibenzo(ah)anthracene	NA	$(ug/m^3)^{-1}$	3500	3.1E+00	mg/kg-day	B2	US EPA	1993
Indeno(123-cd)pyrene	NA	$(ug/m^3)^{-1}$	3500	3.1E-01	mg/kg-day	B2	US EPA	1993
Phthalates								
bis(2-Ethylhexyl)phthalate	4.0E-06	$(ug/m^3)^{-1}$	3500	1.4E-02	mg/kg-day	B2	NCEA	8/2/93
Pesticides								
Aldrin	4.9E-03	$(ug/m^3)^{-1}$	3500	1.7E+01	mg/kg-day	B2	IRIS -Do not use if [air] exceeds 2 ug/m^3	7/13/99
alpha-BHC	1.8E-03	$(ug/m^3)^{-1}$	3500	6.3E+00	mg/kg-day	B2	IRIS -Do not use if [air] exceeds 6 ug/m^3	7/13/99
gamma-BHC (Lindane)	NA	$(ug/m^3)^{-1}$	3500	NA	mg/kg-day	NA	NA	NA
4,4'-DDE	9.7E-05	$(ug/m^3)^{-1}$	3500	NA	mg/kg-day	B2	IRIS (substitute value for 4,4'-DDT)	7/13/99
4,4'-DDT	9.7E-05	$(ug/m^3)^{-1}$	3500	3.4E-01	mg/kg-day	B2	IRIS-Do not use if [air] exceeds 100 ug/m^3	7/13/99
Dieldrin	4.6E-03	$(ug/m^3)^{-1}$	3500	1.6E+01	mg/kg-day	B2	IRIS-Do not use if [air] exceeds 2 ug/m^3	7/13/99

TABLE 6.2

CANCER TOXICITY DATA -- INHALATION

Beede Waste Oil/Cash Energy Site

Chemical of Potential Concern	Unit Risk	Units	Adjustment(1)	Inhalation Cancer Slope Factor	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date (2) (MM/DD/YY)
Heptachlor	1.3E-03	$(ug/m^3)^{-1}$	3500	4.6E+00	mg/kg-day	B2	IRIS-Do not use if [air] exceeds 8 ug/m^3	7/13/99
Heptachlor Epoxide	2.6E-03	$(ug/m^3)^{-1}$	3500	9.1E+00	mg/kg-day	B2	IRIS-Do not use if [air] exceeds 4 ug/m^3	7/13/99
Cis-nonachlor	NA	$(ug/m^3)^{-1}$	3500	NA	mg/kg-day	NA	NA	NA
Trans-nonachlor	NA	$(ug/m^3)^{-1}$	3500	NA	mg/kg-day	NA	NA	NA
Polychlorinated Biphenyls								
Vapor (upper-bound)	1.0E-04	$(ug/m^3)^{-1}$	3500	4.0E-01	mg/kg-day	B2	IRIS-Do not use if [air] exceeds 100 ug/m^3	5/9/99
Vapor (central-estimate)	9.0E-05	$(ug/m^3)^{-1}$	3500	3.0E-01	mg/kg-day	B2	IRIS-Do not use if [air] exceeds 100 ug/m^3	5/9/99
Aerosol or dust (upper-bound)	6.0E-04	$(ug/m^3)^{-1}$	3500	2.0E+00	mg/kg-day	B2	IRIS-Do not use if [air] exceeds 100 ug/m^3	5/9/99
Aerosol or dust (central-estimate)	3.0E-04	$(ug/m^3)^{-1}$	3500	1.0E+00	mg/kg-day	B2	IRIS-Do not use if [air] exceeds 100 ug/m^3	5/9/99
Dioxin TEQ (4)								
2,3,7,8-TCDD (5)	3.3E+01	$(ug/m^3)^{-1}$	3500	1.2E+05	mg/kg-day	B2	HEAST	7/31/97
1,2,3,7,8-PeCDD	3.3E+01	$(ug/m^3)^{-1}$	3500	1.2E+05	mg/kg-day	B2	Van den Berg et al.	1998
1,2,3,4,7,8-HxCDD	3.3E+00	$(ug/m^3)^{-1}$	3500	1.2E+04	mg/kg-day	B2	Van den Berg et al.	1998
1,2,3,6,7,8-HxCDD	3.3E+00	$(ug/m^3)^{-1}$	3500	1.2E+04	mg/kg-day	B2	Van den Berg et al.	1998
1,2,3,7,8,9-HxCDD	3.3E+00	$(ug/m^3)^{-1}$	3500	1.2E+04	mg/kg-day	B2	Van den Berg et al.	1998
1,2,3,4,6,7,8-HpCDD	3.3E-01	$(ug/m^3)^{-1}$	3500	1.2E+03	mg/kg-day	B2	Van den Berg et al.	1998

TABLE 6.2

CANCER TOXICITY DATA -- INHALATION

Beede Waste Oil/Cash Energy Site

Chemical of Potential Concern	Unit Risk	Units	Adjustment(1)	Inhalation Cancer Slope Factor	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date (2) (MM/DD/YY)
OCDD	3.3E-03	$(ug/m^3)^{-1}$	3500	1.2E+01	mg/kg-day	B2	Van den Berg et al.	1998
2,3,7,8-TCDF	3.3E+00	$(ug/m^3)^{-1}$	3500	1.2E+04	mg/kg-day	B2	Van den Berg et al.	1998
1,2,3,7,8-PeCDF	1.7E+00	$(ug/m^3)^{-1}$	3500	5.8E+03	mg/kg-day	B2	Van den Berg et al.	1998
2,3,4,7,8-PeCDF	1.7E+01	$(ug/m^3)^{-1}$	3500	5.8E+04	mg/kg-day	B2	Van den Berg et al.	1998
1,2,3,4,7,8-HxCDF	3.3E+00	$(ug/m^3)^{-1}$	3500	1.2E+04	mg/kg-day	B2	Van den Berg et al.	1998
1,2,3,6,7,8-HxCDF	3.3E+00	$(ug/m^3)^{-1}$	3500	1.2E+04	mg/kg-day	B2	Van den Berg et al.	1998
1,2,3,7,8,9-HxCDF	3.3E+00	$(ug/m^3)^{-1}$	3500	1.2E+04	mg/kg-day	B2	Van den Berg et al.	1998
2,3,4,6,7,8-HxCDF	3.3E+00	$(ug/m^3)^{-1}$	3500	1.2E+04	mg/kg-day	B2	Van den Berg et al.	1998
1,2,3,4,6,7,8-HpCDF	3.3E-01	$(ug/m^3)^{-1}$	3500	1.2E+03	mg/kg-day	B2	Van den Berg et al.	1998
1,2,3,4,7,8,9-HpCDF	3.3E-01	$(ug/m^3)^{-1}$	3500	1.2E+03	mg/kg-day	B2	Van den Berg et al.	1998
OCDF	3.3E-03	$(ug/m^3)^{-1}$	3500	1.2E+01	mg/kg-day	B2	Van den Berg et al.	1998
PCB-77	3.3E-03	$(ug/m^3)^{-1}$	3500	1.2E+01	mg/kg-day	B2	Van den Berg et al.	1998
PCB-81	3.3E-03	$(ug/m^3)^{-1}$	3500	1.2E+01	mg/kg-day	B2	Van den Berg et al.	1998
PCB-118	3.3E-03	$(ug/m^3)^{-1}$	3500	1.2E+01	mg/kg-day	B2	Van den Berg et al.	1998
PCB-123	3.3E-03	$(ug/m^3)^{-1}$	3500	1.2E+01	mg/kg-day	B2	Van den Berg et al.	1998
PCB-105	3.3E-03	$(ug/m^3)^{-1}$	3500	1.2E+01	mg/kg-day	B2	Van den Berg et al.	1998
PCB-114	1.7E-02	$(ug/m^3)^{-1}$	3500	5.8E+01	mg/kg-day	B2	Van den Berg et al.	1998
PCB-126	3.3E+00	$(ug/m^3)^{-1}$	3500	1.2E+04	mg/kg-day	B2	Van den Berg et al.	1998
PCB-128/167	3.3E-04	$(ug/m^3)^{-1}$	3500	1.2E+00	mg/kg-day	B2	Van den Berg et al.	1998
PCB-156	1.7E-02	$(ug/m^3)^{-1}$	3500	5.8E+01	mg/kg-day	B2	Van den Berg et al.	1998
PCB-157	1.7E-02	$(ug/m^3)^{-1}$	3500	5.8E+01	mg/kg-day	B2	Van den Berg et al.	1998
PCB-169	3.3E-01	$(ug/m^3)^{-1}$	3500	1.2E+03	mg/kg-day	B2	Van den Berg et al.	1998
PCB-189	3.3E-03	$(ug/m^3)^{-1}$	3500	1.2E+01	mg/kg-day	B2	Van den Berg et al.	1998
Inorganic Compounds								
Antimony	NA	$(ug/m^3)^{-1}$	3500	NA	mg/kg-day	NA	IRIS	7/13/99

TABLE 6.2

CANCER TOXICITY DATA -- INHALATION

Beede Waste Oil/Cash Energy Site

Chemical of Potential Concern	Unit Risk	Units	Adjustment(1)	Inhalation Cancer Slope Factor	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date (2) (MM/DD/YY)
Arsenic	4.3E-03	$(ug/m^3)^{-1}$	3500	1.5E+01	mg/kg-day	A	IRIS-Do not use if [air] exceeds 2 ug/m^3	7/13/99
Barium	NA	$(ug/m^3)^{-1}$	3500	NA	mg/kg-day	D	IRIS	7/13/99
Beryllium	2.4E-03	$(ug/m^3)^{-1}$	3500	8.4E+00	mg/kg-day	B1	IRIS-Do not use if [air] exceeds 4 ug/m^3	7/13/99
Cadmium (Food)	1.8E-03	$(ug/m^3)^{-1}$	3500	6.3E+00	mg/kg-day	B1	IRIS-Do not use if [air] exceeds 6 ug/m^3	7/13/99
Cadmium (Water)	1.8E-03	$(ug/m^3)^{-1}$	3500	6.3E+00	mg/kg-day	B1	IRIS-Do not use if [air] exceeds 6 ug/m^3	7/13/99
Chromium (VI)	1.2E-02	$(ug/m^3)^{-1}$	3500	4.2E+01	mg/kg-day	A	IRIS-Do not use if [air] exceeds 0.8 ug/m^3	7/13/99
Copper	NA	$(ug/m^3)^{-1}$	3500	NA	mg/kg-day	D	IRIS	7/13/99
Lead	NA	$(ug/m^3)^{-1}$	3500	NA	mg/kg-day	D	IRIS	7/13/99
Manganese	NA	$(ug/m^3)^{-1}$	3500	NA	mg/kg-day	D	IRIS	7/13/99
Mercury	NA	$(ug/m^3)^{-1}$	3500	NA	mg/kg-day	C (6)	IRIS	7/13/99
Molybdenum	NA	$(ug/m^3)^{-1}$	3500	NA	mg/kg-day	NA	NA	NA
Nickel (soluble salts)	NA	$(ug/m^3)^{-1}$	3500	NA	mg/kg-day	NA	IRIS	7/13/99
Selenium	NA	$(ug/m^3)^{-1}$	3500	NA	mg/kg-day	D (7)	IRIS	7/13/99
Thallium	NA	$(ug/m^3)^{-1}$	3500	NA	mg/kg-day	D	NA	07/13/99
Vanadium	NA	$(ug/m^3)^{-1}$	3500	NA	mg/kg-day	NA	NA	NA
Zinc	NA	$(ug/m^3)^{-1}$	3500	NA	mg/kg-day	D	IRIS	7/13/99
N-Nitrate	NA	$(ug/m^3)^{-1}$	3500	NA	mg/kg-day	NA	NA	NA

TABLE 6.2

CANCER TOXICITY DATA -- INHALATION

Beede Waste Oil/Cash Energy Site

Chemical of Potential Concern	Unit Risk	Units	Adjustment(1)	Inhalation Cancer Slope Factor	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date (2) (MM/DD/YY)

NA = Not Available

IRIS = Integrated Risk Information System

NCEA = National Center for Environmental Assessment

STSC= Superfund Technical Support Center

0.04666667

Weight of Evidence: 0.04666667

Known/Likely

Cannot be Determined

Not Likely

EPA Class:

A - Human carcinogen

B1 - Probable human carcinogen - indicates that limited human data are available

B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans

C - Possible human carcinogen

D - Not classifiable as a human carcinogen

E - Evidence of noncarcinogenicity

(1) Adjustment Factor applied to Unit Risk $(ug/m^3)^{-1}$ to calculate Inhalation Slope Factor (mg/kg-day) =

$70\ kg * (20\ m^3/day)^{-1} * 1000\ ug/mg$

(2) For IRIS values, we provided the date IRIS was last searched.

For NCEA values, we provided the date of publication.

(3) Cancer slope factors are expressed as the CSF for benzo(a)pyrene multiplied by a relative potency factor, as described in USEPA, 1993. Provisional Guidance for Quantitative Risk Assessment of Polycyclic Aromatic Hydrocarbons. EPA/600/-3/089.

(4) Cancer slope factors are expressed as the CSF for 2,3,7,8-TCDD multiplied by a toxic equivalency factor (or TEF), as described in Van den Berg et al., 1998. Toxic Equivalency Factors (TEFs) for PCBs, PCDDs, PCDFs, for Humans and Wildlife. *Environmental Health Perspectives* , vol. 106, no. 12. December 1998.

(5) 2,3,7,8-TCDD is classified by the WHO's International Agency for Research on Cancer as a known human carcinogen IARC. 1999. Polychlorinated dibenzo-para- dioxins. IARC Monographs Database on Carcinogenic Risks to Humans. (http://www.iarc.fr)

(6) Weight of evidence/cancer guideline description is for methylmercury and mercuric chloride; weight of evidence classification for elemental mercury = D

(7) Weight of evidence classification for Se sulfide is B2, but no quantified slope factor.

APPENDIX M

LEAD MODEL PARAMETERS AND OUTPUT

(The Model Output is not included in this on-line report. Please contact the USEPA Region 1 Superfund Records Center for further information about this material.)

Table M-1
Inputs for IEUBK Lead Model
Data Entry for Soil/Dust

Input	0-1 foot Soil EPC	0-10 foot Soil EPC
Soil Lead (Pb) Levels (mg/kg)	895	491
Indoor Dust Pb Levels (Multiple Source Average) (mg/kg)	636.5	353.7
Contribution of Soil Pb to Indoor Household Dust Pb (conversion factor)	0.7	0.7
Contribution of Outdoor Airborne Pb to Indoor Household Dust Pb (conversion factor)	100	100
Consider Alternate Indoor Dust Pb Sources?	No	No
Soil/Dust Ingestion Weighting Factor (percent soil)	45	45
Total Dust and Soil Intake (g/day)	0.200 (RME value; same value used for 6 to 84 month old children)	0.200 (RME value; same value used for 6 to 84 month old children)
Change GI values/Bioavailability?	No	No

APPENDIX N

RAGS PART D TABLE 7 SERIES:

CALCULATION OF NON-CANCER HAZARDS

TABLE 7.1.RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Surface and Subsurface Soil
Exposure Point: 0 to 10 foot soil
Receptor Population: Resident
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (2)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (3)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient (4)
Soil Ingestion	sec-Butylbenzene	1.80E-01	mg/kg	1.80E-01	mg/kg	M	1.13E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,2-Dichloroethene (cis)	1.10E+01	mg/kg	1.10E+01	mg/kg	M	6.89E-06	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	7.E-04
	para-Isopropyltoluene	1.90E-01	mg/kg	1.90E-01	mg/kg	M	1.19E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	n-Propylbenzene	2.10E-01	mg/kg	2.10E-01	mg/kg	M	1.32E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Tetrachloroethene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	8.14E-08	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	8.E-06
	1,2,4-Trimethylbenzene	2.80E+00	mg/kg	2.80E+00	mg/kg	M	1.75E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,3,5-Trimethylbenzene	7.40E-01	mg/kg	7.40E-01	mg/kg	M	4.63E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	C9-C18 Aliphatics	1.10E+03	mg/kg	1.10E+03	mg/kg	M	6.89E-04	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	7.E-03
	C11-C22 Aromatics	6.60E+02	mg/kg	6.60E+02	mg/kg	M	4.13E-04	mg/kg/day	3.00E-02	mg/kg-day	NA	NA	1.E-02
	Naphthalene	8.00E-01	mg/kg	8.00E-01	mg/kg	M	5.01E-07	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	3.E-05
	Benz(a)anthracene	8.80E-01	mg/kg	8.80E-01	mg/kg	M	5.51E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(a)pyrene	2.00E+00	mg/kg	2.00E+00	mg/kg	M	1.25E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(b)fluoranthene	5.40E-01	mg/kg	5.40E-01	mg/kg	M	3.38E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(k)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	1.06E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Chrysene	7.50E-01	mg/kg	7.50E-01	mg/kg	M	4.70E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Dibenzo(ah)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	1.38E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Indeno(123-cd)pyrene	3.60E-01	mg/kg	3.60E-01	mg/kg	M	2.25E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	bis(2-Ethylhexyl)phthalate	3.40E+01	mg/kg	3.40E+01	mg/kg	M	2.13E-05	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	1.E-03
	Polychlorinated Biphenyls	9.80E+01	mg/kg	9.80E+01	mg/kg	M	6.14E-05	mg/kg/day	2.00E-05	mg/kg-day	NA	NA	3.E+00
	Antimony	7.40E-01	mg/kg	7.40E-01	mg/kg	M	4.63E-07	mg/kg/day	4.00E-04	mg/kg-day	NA	NA	1.E-03
	Arsenic	6.60E+00	mg/kg	6.60E+00	mg/kg	M	4.13E-06	mg/kg/day	3.00E-04	mg/kg-day	NA	NA	1.E-02
	Barium	7.80E+01	mg/kg	7.80E+01	mg/kg	M	4.88E-05	mg/kg/day	7.00E-02	mg/kg-day	NA	NA	7.E-04
	Beryllium	1.80E+00	mg/kg	1.80E+00	mg/kg	M	1.13E-06	mg/kg/day	2.00E-03	mg/kg-day	NA	NA	6.E-04
	Cadmium (Food)	4.40E+01	mg/kg	4.40E+01	mg/kg	M	2.76E-05	mg/kg/day	1.00E-03	mg/kg-day	NA	NA	3.E-02
	Chromium VI (particulates)	5.30E+02	mg/kg	5.30E+02	mg/kg	M	3.32E-04	mg/kg/day	3.00E-03	mg/kg-day	NA	NA	1.E-01
	Copper	4.70E+01	mg/kg	4.70E+01	mg/kg	M	2.94E-05	mg/kg/day	4.00E-02	mg/kg-day	NA	NA	7.E-04
	Lead	4.90E+02	mg/kg	4.90E+02	mg/kg	M	3.07E-04	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Manganese	1.10E+03	mg/kg	1.10E+03	mg/kg	M	6.89E-04	mg/kg/day	7.00E-02	mg/kg-day	NA	NA	1.E-02
	Mercury	2.40E+01	mg/kg	2.40E+01	mg/kg	M	1.50E-05	mg/kg/day	1.00E-04	mg/kg-day	NA	NA	2.E-01
	Molybdenum	9.30E+01	mg/kg	9.30E+01	mg/kg	M	5.82E-05	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	1.E-02
	Nickel	9.20E+02	mg/kg	9.20E+02	mg/kg	M	5.76E-04	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	3.E-02
	Vanadium	1.80E+01	mg/kg	1.80E+01	mg/kg	M	1.13E-05	mg/kg/day	7.00E-03	mg/kg-day	NA	NA	2.E-03
	Zinc	1.30E+02	mg/kg	1.30E+02	mg/kg	M	8.14E-05	mg/kg/day	3.00E-01	mg/kg-day	NA	NA	3.E-04
	(Total)												3.E+00
												Total Hazard Index Across Direct Exposure Routes/Pathways	5.E+01
												Total Hazard Index Across All Exposure Routes/Pathways	7.E+01

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (2)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (3)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient (4)
Soil	sec-Butylbenzene	1.80E-01	mg/kg	1.80E-01	mg/kg	M	4.50E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
Dermal	1,2-Dichloroethene (cis)	1.10E+01	mg/kg	1.10E+01	mg/kg	M	0.00E+00	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	---
	para-Isopropyltoluene	1.90E-01	mg/kg	1.90E-01	mg/kg	M	4.75E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	n-Propylbenzene	2.10E-01	mg/kg	2.10E-01	mg/kg	M	5.25E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Tetrachloroethene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	0.00E+00	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	---
	1,2,4-Trimethylbenzene	2.80E+00	mg/kg	2.80E+00	mg/kg	M	7.00E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,3,5-Trimethylbenzene	7.40E-01	mg/kg	7.40E-01	mg/kg	M	1.85E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	C9-C18 Aliphatics	1.10E+03	mg/kg	1.10E+03	mg/kg	M	5.50E-04	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	5.E-03
	C11-C22 Aromatics	6.60E+02	mg/kg	6.60E+02	mg/kg	M	2.97E-04	mg/kg/day	3.00E-02	mg/kg-day	NA	NA	1.E-02
	Naphthalene	8.00E-01	mg/kg	8.00E-01	mg/kg	M	2.00E-06	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	1.E-04
	Benz(a)anthracene	8.80E-01	mg/kg	8.80E-01	mg/kg	M	2.86E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(a)pyrene	2.00E+00	mg/kg	2.00E+00	mg/kg	M	6.50E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(b)fluoranthene	5.40E-01	mg/kg	5.40E-01	mg/kg	M	1.75E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(k)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	5.52E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Chrysene	7.50E-01	mg/kg	7.50E-01	mg/kg	M	2.44E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Dibenzo(ah)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	7.15E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Indeno(123-cd)pyrene	3.60E-01	mg/kg	3.60E-01	mg/kg	M	1.17E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	bis(2-Ethylhexyl)phthalate	3.40E+01	mg/kg	3.40E+01	mg/kg	M	1.10E-05	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	6.E-04
	Polychlorinated Biphenyls	9.80E+01	mg/kg	9.80E+01	mg/kg	M	3.43E-05	mg/kg/day	2.00E-05	mg/kg-day	NA	NA	2.E+00
	Antimony	7.40E-01	mg/kg	7.40E-01	mg/kg	M	1.85E-08	mg/kg/day	4.00E-05	mg/kg-day	NA	NA	5.E-04
	Arsenic	6.60E+00	mg/kg	6.60E+00	mg/kg	M	4.95E-07	mg/kg/day	2.85E-04	mg/kg-day	NA	NA	2.E-03
	Barium	7.80E+01	mg/kg	7.80E+01	mg/kg	M	1.95E-06	mg/kg/day	3.50E-03	mg/kg-day	NA	NA	6.E-04
	Beryllium	1.80E+00	mg/kg	1.80E+00	mg/kg	M	4.50E-08	mg/kg/day	2.00E-05	mg/kg-day	NA	NA	2.E-03
	Cadmium (Food)	4.40E+01	mg/kg	4.40E+01	mg/kg	M	1.10E-06	mg/kg/day	2.50E-05	mg/kg-day	NA	NA	4.E-02
	Chromium VI (particulates)	5.30E+02	mg/kg	5.30E+02	mg/kg	M	1.32E-05	mg/kg/day	3.00E-05	mg/kg-day	NA	NA	4.E-01
	Copper	4.70E+01	mg/kg	4.70E+01	mg/kg	M	1.17E-06	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	6.E-05
	Lead	4.90E+02	mg/kg	4.90E+02	mg/kg	M	1.22E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Manganese	1.10E+03	mg/kg	1.10E+03	mg/kg	M	2.75E-05	mg/kg/day	3.50E-03	mg/kg-day	NA	NA	8.E-03
	Mercury	2.40E+01	mg/kg	2.40E+01	mg/kg	M	6.00E-07	mg/kg/day	7.00E-06	mg/kg-day	NA	NA	9.E-02
	Molybdenum	9.30E+01	mg/kg	9.30E+01	mg/kg	M	2.32E-06	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	5.E-04
	Nickel	9.20E+02	mg/kg	9.20E+02	mg/kg	M	2.30E-05	mg/kg/day	2.00E-04	mg/kg-day	NA	NA	1.E-01
	Vanadium	1.80E+01	mg/kg	1.80E+01	mg/kg	M	4.50E-07	mg/kg/day	1.40E-04	mg/kg-day	NA	NA	3.E-03
	Zinc	1.30E+02	mg/kg	1.30E+02	mg/kg	M	3.25E-06	mg/kg/day	7.50E-02	mg/kg-day	NA	NA	4.E-05
	(Total)												2.E+00
												Total Hazard Index Across Direct Exposure Routes/Pathways	5.E+01
												Total Hazard Index Across All Exposure Routes/Pathways	7.E+01

(1) Dioxin-like PCB and dioxin congeners are not shown on this table because we do not evaluate non-carcinogenic risk of these compounds.
(2) M indicates the Medium EPC was used while R indicates the Route EPC was used.
(3) All reference doses are chronic values.
(4) The "Total Hazard Index Across Direct Exposure Routes/Pathways" is the HI for the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.
The "Total Hazard Index Across All Exposure Routes/Pathways" is the HI for the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.

TABLE 7.1.CT
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Surface and Subsurface Soil
Exposure Point: 0 to 10 foot soil
Receptor Population: Resident
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (2)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (3)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient (4)
Soil Ingestion	sec-Butylbenzene	1.80E-01	mg/kg	1.80E-01	mg/kg	M	5.64E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,2-Dichloroethene (cis)	1.80E-01	mg/kg	1.80E-01	mg/kg	M	5.64E-08	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	6.E-06
	para-Isopropyltoluene	1.90E-01	mg/kg	1.90E-01	mg/kg	M	5.95E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	n-Propylbenzene	2.10E-01	mg/kg	2.10E-01	mg/kg	M	6.58E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Tetrachloroethene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	4.07E-08	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	4.E-06
	1,2,4-Trimethylbenzene	2.80E+00	mg/kg	2.80E+00	mg/kg	M	8.77E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,3,5-Trimethylbenzene	7.40E-01	mg/kg	7.40E-01	mg/kg	M	2.32E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	C9-C18 Aliphatics	1.10E+03	mg/kg	1.10E+03	mg/kg	M	3.44E-04	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	3.E-03
	C11-C22 Aromatics	6.60E+02	mg/kg	6.60E+02	mg/kg	M	2.07E-04	mg/kg/day	3.00E-02	mg/kg-day	NA	NA	7.E-03
	Naphthalene	8.00E-01	mg/kg	8.00E-01	mg/kg	M	2.50E-07	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	1.E-05
	Benz(a)anthracene	8.80E-01	mg/kg	8.80E-01	mg/kg	M	2.76E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(a)pyrene	3.70E-01	mg/kg	3.70E-01	mg/kg	M	1.16E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(b)fluoranthene	5.40E-01	mg/kg	5.40E-01	mg/kg	M	1.69E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(k)fluoranthene	3.30E-01	mg/kg	3.30E-01	mg/kg	M	1.03E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Chrysene	7.50E-01	mg/kg	7.50E-01	mg/kg	M	2.35E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Dibenz(ah)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	6.89E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Indeno(123-cd)pyrene	3.60E-01	mg/kg	3.60E-01	mg/kg	M	1.13E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	bis(2-Ethylhexyl)phthalate	3.40E+01	mg/kg	3.40E+01	mg/kg	M	1.06E-05	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	5.E-04
	Polychlorinated Biphenyls	9.80E+01	mg/kg	9.80E+01	mg/kg	M	3.07E-05	mg/kg/day	2.00E-05	mg/kg-day	NA	NA	2.E+00
	Antimony	7.40E-01	mg/kg	7.40E-01	mg/kg	M	2.32E-07	mg/kg/day	4.00E-04	mg/kg-day	NA	NA	6.E-04
	Arsenic	6.60E+00	mg/kg	6.60E+00	mg/kg	M	2.07E-06	mg/kg/day	3.00E-04	mg/kg-day	NA	NA	7.E-03
	Barium	7.80E+01	mg/kg	7.80E+01	mg/kg	M	2.44E-05	mg/kg/day	7.00E-02	mg/kg-day	NA	NA	3.E-04
	Beryllium	4.00E-01	mg/kg	4.00E-01	mg/kg	M	1.25E-07	mg/kg/day	2.00E-03	mg/kg-day	NA	NA	6.E-05
	Cadmium (Food)	1.30E+00	mg/kg	1.30E+00	mg/kg	M	4.07E-07	mg/kg/day	1.00E-03	mg/kg-day	NA	NA	4.E-04
	Chromium VI (particulates)	2.60E+01	mg/kg	2.60E+01	mg/kg	M	8.14E-06	mg/kg/day	3.00E-03	mg/kg-day	NA	NA	3.E-03
	Copper	4.70E+01	mg/kg	4.70E+01	mg/kg	M	1.47E-05	mg/kg/day	4.00E-02	mg/kg-day	NA	NA	4.E-04
	Lead	4.90E+02	mg/kg	4.90E+02	mg/kg	M	1.53E-04	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Manganese	1.60E+02	mg/kg	1.60E+02	mg/kg	M	5.01E-05	mg/kg/day	7.00E-02	mg/kg-day	NA	NA	7.E-04
	Mercury	6.10E+00	mg/kg	6.10E+00	mg/kg	M	1.91E-06	mg/kg/day	1.00E-04	mg/kg-day	NA	NA	2.E-02
	Molybdenum	2.40E+00	mg/kg	2.40E+00	mg/kg	M	7.51E-07	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	2.E-04
	Nickel	2.30E+01	mg/kg	2.30E+01	mg/kg	M	7.20E-06	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	4.E-04
	Vanadium	1.80E+01	mg/kg	1.80E+01	mg/kg	M	5.64E-06	mg/kg/day	7.00E-03	mg/kg-day	NA	NA	8.E-04
	Zinc	1.30E+02	mg/kg	1.30E+02	mg/kg	M	4.07E-05	mg/kg/day	3.00E-01	mg/kg-day	NA	NA	1.E-04
	(Total)												2.E+00
												Total Hazard Index Across Direct Exposure Routes/Pathways	5.E+00
												Total Hazard Index Across All Exposure Routes/Pathways	6.E+00

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (2)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (3)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient (4)
Soil	sec-Butylbenzene	1.80E-01	mg/kg	1.80E-01	mg/kg	M	6.43E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
Dermal	1,2-Dichloroethene (cis)	1.80E-01	mg/kg	1.80E-01	mg/kg	M	0.00E+00	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	---
	para-Isopropyltoluene	1.90E-01	mg/kg	1.90E-01	mg/kg	M	6.78E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	n-Propylbenzene	2.10E-01	mg/kg	2.10E-01	mg/kg	M	7.50E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Tetrachloroethene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	0.00E+00	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	---
	1,2,4-Trimethylbenzene	2.80E+00	mg/kg	2.80E+00	mg/kg	M	9.99E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,3,5-Trimethylbenzene	7.40E-01	mg/kg	7.40E-01	mg/kg	M	2.64E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	C9-C18 Aliphatics	1.10E+03	mg/kg	1.10E+03	mg/kg	M	7.85E-05	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	8.E-04
	C11-C22 Aromatics	6.60E+02	mg/kg	6.60E+02	mg/kg	M	4.24E-05	mg/kg/day	3.00E-02	mg/kg-day	NA	NA	1.E-03
	Naphthalene	8.00E-01	mg/kg	8.00E-01	mg/kg	M	2.86E-07	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	1.E-05
	Benz(a)anthracene	8.80E-01	mg/kg	8.80E-01	mg/kg	M	4.08E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(a)pyrene	3.70E-01	mg/kg	3.70E-01	mg/kg	M	1.72E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(b)fluoranthene	5.40E-01	mg/kg	5.40E-01	mg/kg	M	2.51E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(k)fluoranthene	3.30E-01	mg/kg	3.30E-01	mg/kg	M	1.53E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Chrysene	7.50E-01	mg/kg	7.50E-01	mg/kg	M	3.48E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Dibenz(ah)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	1.02E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Indeno(123-cd)pyrene	3.60E-01	mg/kg	3.60E-01	mg/kg	M	1.67E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	bis(2-Ethylhexyl)phthalate	3.40E+01	mg/kg	3.40E+01	mg/kg	M	1.58E-06	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	8.E-05
	Polychlorinated Biphenyls	9.80E+01	mg/kg	9.80E+01	mg/kg	M	4.90E-06	mg/kg/day	2.00E-05	mg/kg-day	NA	NA	2.E-01
	Antimony	7.40E-01	mg/kg	7.40E-01	mg/kg	M	2.64E-09	mg/kg/day	4.00E-05	mg/kg-day	NA	NA	7.E-05
	Arsenic	6.60E+00	mg/kg	6.60E+00	mg/kg	M	7.07E-08	mg/kg/day	2.85E-04	mg/kg-day	NA	NA	2.E-04
	Barium	7.80E+01	mg/kg	7.80E+01	mg/kg	M	2.78E-07	mg/kg/day	3.50E-03	mg/kg-day	NA	NA	8.E-05
	Beryllium	4.00E-01	mg/kg	4.00E-01	mg/kg	M	1.43E-09	mg/kg/day	2.00E-05	mg/kg-day	NA	NA	7.E-05
	Cadmium (Food)	1.30E+00	mg/kg	1.30E+00	mg/kg	M	4.64E-09	mg/kg/day	2.50E-05	mg/kg-day	NA	NA	2.E-04
	Chromium VI (particulates)	2.60E+01	mg/kg	2.60E+01	mg/kg	M	9.28E-08	mg/kg/day	3.00E-05	mg/kg-day	NA	NA	3.E-03
	Copper	4.70E+01	mg/kg	4.70E+01	mg/kg	M	1.68E-07	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	8.E-06
	Lead	4.90E+02	mg/kg	4.90E+02	mg/kg	M	1.75E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Manganese	1.60E+02	mg/kg	1.60E+02	mg/kg	M	5.71E-07	mg/kg/day	3.50E-03	mg/kg-day	NA	NA	2.E-04
	Mercury	6.10E+00	mg/kg	6.10E+00	mg/kg	M	2.18E-08	mg/kg/day	7.00E-06	mg/kg-day	NA	NA	3.E-03
	Molybdenum	2.40E+00	mg/kg	2.40E+00	mg/kg	M	8.57E-09	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	2.E-06
	Nickel	2.30E+01	mg/kg	2.30E+01	mg/kg	M	8.21E-08	mg/kg/day	2.00E-04	mg/kg-day	NA	NA	4.E-04
	Vanadium	1.80E+01	mg/kg	1.80E+01	mg/kg	M	6.43E-08	mg/kg/day	1.40E-04	mg/kg-day	NA	NA	5.E-04
	Zinc	1.30E+02	mg/kg	1.30E+02	mg/kg	M	4.64E-07	mg/kg/day	7.50E-02	mg/kg-day	NA	NA	6.E-06
	(Total)												3.E-01
												Total Hazard Index Across Direct Exposure Routes/Pathways	5.E+00
												Total Hazard Index Across All Exposure Routes/Pathways	6.E+00

(1) Dioxin-like PCB and dioxin congeners are not shown on this table because we do not evaluate non-carcinogenic risk of these compounds.
(2) M indicates the Medium EPC was used while R indicates the Route EPC was used.
(3) All reference doses are chronic values.
(4) The "Total Hazard Index Across Direct Exposure Routes/Pathways" is the HI for the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.
The "Total Hazard Index Across All Exposure Routes/Pathways" is the HI for the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.

TABLE 7.2.RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Surface and Subsurface Soil
Exposure Point: 0 to 10 foot soil
Receptor Population: Resident
Receptor Age: Child

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (2)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (3)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient (4)
Soil Ingestion	sec-Butylbenzene	1.80E-01	mg/kg	1.80E-01	mg/kg	M	1.05E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,2-Dichloroethene (cis)	1.10E+01	mg/kg	1.10E+01	mg/kg	M	6.43E-05	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	6.E-03
	para-Isopropyltoluene	1.90E-01	mg/kg	1.90E-01	mg/kg	M	1.11E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	n-Propylbenzene	2.10E-01	mg/kg	2.10E-01	mg/kg	M	1.23E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Tetrachloroethene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	7.60E-07	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	8.E-05
	1,2,4-Trimethylbenzene	2.80E+00	mg/kg	2.80E+00	mg/kg	M	1.64E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,3,5-Trimethylbenzene	7.40E-01	mg/kg	7.40E-01	mg/kg	M	4.33E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	C9-C18 Aliphatics	1.10E+03	mg/kg	1.10E+03	mg/kg	M	6.43E-03	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	6.E-02
	C11-C22 Aromatics	6.60E+02	mg/kg	6.60E+02	mg/kg	M	3.86E-03	mg/kg/day	3.00E-02	mg/kg-day	NA	NA	1.E-01
	Naphthalene	8.00E-01	mg/kg	8.00E-01	mg/kg	M	4.03E-06	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	2.E-04
	Benz(a)anthracene	8.80E-01	mg/kg	8.80E-01	mg/kg	M	5.14E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(a)pyrene	2.00E+00	mg/kg	2.00E+00	mg/kg	M	1.17E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(b)fluoranthene	5.40E-01	mg/kg	5.40E-01	mg/kg	M	3.16E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(k)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	9.94E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Chrysene	7.50E-01	mg/kg	7.50E-01	mg/kg	M	4.38E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Dibenz(ah)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	1.29E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Indeno(123-cd)pyrene	3.60E-01	mg/kg	3.60E-01	mg/kg	M	2.10E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	bis(2-Ethylhexyl)phthalate	3.40E+01	mg/kg	3.40E+01	mg/kg	M	1.99E-04	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	1.E-02
	Polychlorinated Biphenyls	9.80E+01	mg/kg	9.80E+01	mg/kg	M	5.73E-04	mg/kg/day	2.00E-05	mg/kg-day	NA	NA	3.E+01
	Antimony	7.40E-01	mg/kg	7.40E-01	mg/kg	M	4.33E-06	mg/kg/day	4.00E-04	mg/kg-day	NA	NA	1.E-02
	Arsenic	6.60E+00	mg/kg	6.60E+00	mg/kg	M	3.86E-05	mg/kg/day	3.00E-04	mg/kg-day	NA	NA	1.E-01
	Barium	7.80E+01	mg/kg	7.80E+01	mg/kg	M	4.56E-04	mg/kg/day	7.00E-02	mg/kg-day	NA	NA	7.E-03
	Beryllium	1.80E+00	mg/kg	1.80E+00	mg/kg	M	1.05E-05	mg/kg/day	2.00E-03	mg/kg-day	NA	NA	5.E-03
	Cadmium (Food)	4.40E+01	mg/kg	4.40E+01	mg/kg	M	2.57E-04	mg/kg/day	1.00E-03	mg/kg-day	NA	NA	3.E-01
	Chromium VI (particulates)	5.30E+02	mg/kg	5.30E+02	mg/kg	M	3.10E-03	mg/kg/day	3.00E-03	mg/kg-day	NA	NA	1.E+00
	Copper	4.70E+01	mg/kg	4.70E+01	mg/kg	M	2.75E-04	mg/kg/day	4.00E-02	mg/kg-day	NA	NA	7.E-03
	Lead	4.90E+02	mg/kg	4.90E+02	mg/kg	M	2.86E-03	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Manganese	1.10E+03	mg/kg	1.10E+03	mg/kg	M	6.43E-03	mg/kg/day	7.00E-02	mg/kg-day	NA	NA	9.E-02
	Mercury	2.40E+01	mg/kg	2.40E+01	mg/kg	M	1.40E-04	mg/kg/day	1.00E-04	mg/kg-day	NA	NA	1.E+00
	Molybdenum	9.30E+01	mg/kg	9.30E+01	mg/kg	M	5.44E-04	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	1.E-01
	Nickel	9.20E+02	mg/kg	9.20E+02	mg/kg	M	5.38E-03	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	3.E-01
	Vanadium	1.80E+01	mg/kg	1.80E+01	mg/kg	M	1.05E-04	mg/kg/day	7.00E-03	mg/kg-day	NA	NA	2.E-02
	Zinc	1.30E+02	mg/kg	1.30E+02	mg/kg	M	7.60E-04	mg/kg/day	3.00E-01	mg/kg-day	NA	NA	3.E-03
	(Total)												3.E+01
												Total Hazard Index Across Direct Exposure Routes/Pathways	2.E+02
												Total Hazard Index Across All Exposure Routes/Pathways	2.E+02

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (2)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (3)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient (4)
Soil	sec-Butylbenzene	1.80E-01	mg/kg	1.80E-01	mg/kg	M	3.05E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
Dermal	1,2-Dichloroethene (cis)	1.10E+01	mg/kg	1.10E+01	mg/kg	M	0.00E+00	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	---
	para-Isopropyltoluene	1.90E-01	mg/kg	1.90E-01	mg/kg	M	3.22E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	n-Propylbenzene	2.10E-01	mg/kg	2.10E-01	mg/kg	M	3.56E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Tetrachloroethene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	0.00E+00	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	---
	1,2,4-Trimethylbenzene	2.80E+00	mg/kg	2.80E+00	mg/kg	M	4.75E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,3,5-Trimethylbenzene	7.40E-01	mg/kg	7.40E-01	mg/kg	M	1.25E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	C9-C18 Aliphatics	1.10E+03	mg/kg	1.10E+03	mg/kg	M	3.73E-03	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	4.E-02
	C11-C22 Aromatics	6.60E+02	mg/kg	6.60E+02	mg/kg	M	2.01E-03	mg/kg/day	3.00E-02	mg/kg-day	NA	NA	7.E-02
	Naphthalene	8.00E-01	mg/kg	8.00E-01	mg/kg	M	1.36E-05	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	7.E-04
	Benz(a)anthracene	8.80E-01	mg/kg	8.80E-01	mg/kg	M	1.94E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(a)pyrene	2.00E+00	mg/kg	2.00E+00	mg/kg	M	4.41E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(b)fluoranthene	5.40E-01	mg/kg	5.40E-01	mg/kg	M	1.19E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(k)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	3.75E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Chrysene	7.50E-01	mg/kg	7.50E-01	mg/kg	M	1.65E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Dibenz(ah)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	4.85E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Indeno(123-cd)pyrene	3.60E-01	mg/kg	3.60E-01	mg/kg	M	7.93E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	bis(2-Ethylhexyl)phthalate	3.40E+01	mg/kg	3.40E+01	mg/kg	M	7.49E-05	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	4.E-03
	Polychlorinated Biphenyls	9.80E+01	mg/kg	9.80E+01	mg/kg	M	2.33E-04	mg/kg/day	2.00E-05	mg/kg-day	NA	NA	1.E+01
	Antimony	7.40E-01	mg/kg	7.40E-01	mg/kg	M	1.25E-07	mg/kg/day	4.00E-05	mg/kg-day	NA	NA	3.E-03
	Arsenic	6.60E+00	mg/kg	6.60E+00	mg/kg	M	3.36E-06	mg/kg/day	2.85E-04	mg/kg-day	NA	NA	1.E-02
	Barium	7.80E+01	mg/kg	7.80E+01	mg/kg	M	1.32E-05	mg/kg/day	3.50E-03	mg/kg-day	NA	NA	4.E-03
	Beryllium	1.80E+00	mg/kg	1.80E+00	mg/kg	M	3.05E-07	mg/kg/day	2.00E-05	mg/kg-day	NA	NA	2.E-02
	Cadmium (Food)	4.40E+01	mg/kg	4.40E+01	mg/kg	M	7.46E-06	mg/kg/day	2.50E-05	mg/kg-day	NA	NA	3.E-01
	Chromium VI (particulates)	5.30E+02	mg/kg	5.30E+02	mg/kg	M	8.98E-05	mg/kg/day	3.00E-05	mg/kg-day	NA	NA	3.E+00
	Copper	4.70E+01	mg/kg	4.70E+01	mg/kg	M	7.97E-06	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	4.E-04
	Lead	4.90E+02	mg/kg	4.90E+02	mg/kg	M	8.31E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Manganese	1.10E+03	mg/kg	1.10E+03	mg/kg	M	1.86E-04	mg/kg/day	3.50E-03	mg/kg-day	NA	NA	5.E-02
	Mercury	2.40E+01	mg/kg	2.40E+01	mg/kg	M	4.07E-06	mg/kg/day	7.00E-06	mg/kg-day	NA	NA	6.E-01
	Molybdenum	9.30E+01	mg/kg	9.30E+01	mg/kg	M	1.58E-05	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	3.E-03
	Nickel	9.20E+02	mg/kg	9.20E+02	mg/kg	M	1.56E-04	mg/kg/day	2.00E-04	mg/kg-day	NA	NA	8.E-01
	Vanadium	1.80E+01	mg/kg	1.80E+01	mg/kg	M	3.05E-06	mg/kg/day	1.40E-04	mg/kg-day	NA	NA	2.E-02
	Zinc	1.30E+02	mg/kg	1.30E+02	mg/kg	M	2.20E-05	mg/kg/day	7.50E-02	mg/kg-day	NA	NA	3.E-04
	(Total)												2.E+01
												Total Hazard Index Across Direct Exposure Routes/Pathways	2.E+02
												Total Hazard Index Across All Exposure Routes/Pathways	2.E+02

(1) Dioxin-like PCB and dioxin congeners are not shown on this table because we do not evaluate non-carcinogenic risk of these compounds.
(2) M indicates the Medium EPC was used while R indicates the Route EPC was used.
(3) All reference doses are chronic values.
(4) The "Total Hazard Index Across Direct Exposure Routes/Pathways" is the HI for the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.
The "Total Hazard Index Across All Exposure Routes/Pathways" is the HI for the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.

TABLE 7.2.CT
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Surface and Subsurface Soil
Exposure Point: 0 to 10 foot soil
Receptor Population: Resident
Receptor Age: Child

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (2)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (3)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient (4)
Soil Ingestion	sec-Butylbenzene	1.80E-01	mg/kg	1.80E-01	mg/kg	M	5.26E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,2-Dichloroethene (cis)	1.80E-01	mg/kg	1.80E-01	mg/kg	M	5.26E-07	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	5.E-05
	para-Isopropyltoluene	1.90E-01	mg/kg	1.90E-01	mg/kg	M	5.55E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	n-Propylbenzene	2.10E-01	mg/kg	2.10E-01	mg/kg	M	6.14E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Tetrachloroethene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	3.80E-07	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	4.E-05
	1,2,4-Trimethylbenzene	2.80E+00	mg/kg	2.80E+00	mg/kg	M	8.18E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,3,5-Trimethylbenzene	7.40E-01	mg/kg	7.40E-01	mg/kg	M	2.16E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	C9-C18 Aliphatics	1.10E+03	mg/kg	1.10E+03	mg/kg	M	3.21E-03	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	3.E-02
	C11-C22 Aromatics	6.60E+02	mg/kg	6.60E+02	mg/kg	M	1.93E-03	mg/kg/day	3.00E-02	mg/kg-day	NA	NA	6.E-02
	Naphthalene	8.00E-01	mg/kg	8.00E-01	mg/kg	M	2.34E-06	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	1.E-04
	Benz(a)anthracene	8.80E-01	mg/kg	8.80E-01	mg/kg	M	2.57E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(a)pyrene	3.70E-01	mg/kg	3.70E-01	mg/kg	M	1.08E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(b)fluoranthene	5.40E-01	mg/kg	5.40E-01	mg/kg	M	1.58E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(k)fluoranthene	3.30E-01	mg/kg	3.30E-01	mg/kg	M	9.64E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Chrysene	7.50E-01	mg/kg	7.50E-01	mg/kg	M	2.19E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Dibenz(ah)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	6.43E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Indeno(123-cd)pyrene	3.60E-01	mg/kg	3.60E-01	mg/kg	M	1.05E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	bis(2-Ethylhexyl)phthalate	3.40E+01	mg/kg	3.40E+01	mg/kg	M	9.94E-05	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	5.E-03
	Polychlorinated Biphenyls	9.80E+01	mg/kg	9.80E+01	mg/kg	M	2.86E-04	mg/kg/day	2.00E-05	mg/kg-day	NA	NA	1.E+01
	Antimony	7.40E-01	mg/kg	7.40E-01	mg/kg	M	2.16E-06	mg/kg/day	4.00E-04	mg/kg-day	NA	NA	5.E-03
	Arsenic	6.60E+00	mg/kg	6.60E+00	mg/kg	M	1.93E-05	mg/kg/day	3.00E-04	mg/kg-day	NA	NA	6.E-02
	Barium	7.80E+01	mg/kg	7.80E+01	mg/kg	M	2.28E-04	mg/kg/day	7.00E-02	mg/kg-day	NA	NA	3.E-03
	Beryllium	4.00E-01	mg/kg	4.00E-01	mg/kg	M	1.17E-06	mg/kg/day	2.00E-03	mg/kg-day	NA	NA	6.E-04
	Cadmium (Food)	1.30E+00	mg/kg	1.30E+00	mg/kg	M	3.80E-06	mg/kg/day	1.00E-03	mg/kg-day	NA	NA	4.E-03
	Chromium VI (particulates)	2.60E+01	mg/kg	2.60E+01	mg/kg	M	7.60E-05	mg/kg/day	3.00E-03	mg/kg-day	NA	NA	3.E-02
	Copper	4.70E+01	mg/kg	4.70E+01	mg/kg	M	1.37E-04	mg/kg/day	4.00E-02	mg/kg-day	NA	NA	3.E-03
	Lead	4.90E+02	mg/kg	4.90E+02	mg/kg	M	1.43E-03	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Manganese	1.60E+02	mg/kg	1.60E+02	mg/kg	M	4.68E-04	mg/kg/day	7.00E-02	mg/kg-day	NA	NA	7.E-03
	Mercury	6.10E+00	mg/kg	6.10E+00	mg/kg	M	1.78E-05	mg/kg/day	1.00E-04	mg/kg-day	NA	NA	2.E-01
	Molybdenum	2.40E+00	mg/kg	2.40E+00	mg/kg	M	7.01E-06	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	1.E-03
	Nickel	2.30E+01	mg/kg	2.30E+01	mg/kg	M	6.72E-05	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	3.E-03
	Vanadium	1.80E+01	mg/kg	1.80E+01	mg/kg	M	5.26E-05	mg/kg/day	7.00E-03	mg/kg-day	NA	NA	8.E-03
	Zinc	1.30E+02	mg/kg	1.30E+02	mg/kg	M	3.80E-04	mg/kg/day	3.00E-01	mg/kg-day	NA	NA	1.E-03
	(Total)												1.E+01
												Total Hazard Index Across Direct Exposure Routes/Pathways	3.E+01
												Total Hazard Index Across All Exposure Routes/Pathways	3.E+01

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (2)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (3)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient (4)
Soil	sec-Butylbenzene	1.80E-01	mg/kg	1.80E-01	mg/kg	M	9.15E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
Dermal	1,2-Dichloroethene (cis)	1.80E-01	mg/kg	1.80E-01	mg/kg	M	0.00E+00	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	---
	para-Isopropyltoluene	1.90E-01	mg/kg	1.90E-01	mg/kg	M	9.66E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	n-Propylbenzene	2.10E-01	mg/kg	2.10E-01	mg/kg	M	1.07E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Tetrachloroethene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	0.00E+00	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	---
	1,2,4-Trimethylbenzene	2.80E+00	mg/kg	2.80E+00	mg/kg	M	1.42E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,3,5-Trimethylbenzene	7.40E-01	mg/kg	7.40E-01	mg/kg	M	3.76E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	C9-C18 Aliphatics	1.10E+03	mg/kg	1.10E+03	mg/kg	M	1.12E-03	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	1.E-02
	C11-C22 Aromatics	6.60E+02	mg/kg	6.60E+02	mg/kg	M	6.04E-04	mg/kg/day	3.00E-02	mg/kg-day	NA	NA	2.E-02
	Naphthalene	8.00E-01	mg/kg	8.00E-01	mg/kg	M	4.07E-06	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	2.E-04
	Benz(a)anthracene	8.80E-01	mg/kg	8.80E-01	mg/kg	M	5.82E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(a)pyrene	3.70E-01	mg/kg	3.70E-01	mg/kg	M	2.45E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(b)fluoranthene	5.40E-01	mg/kg	5.40E-01	mg/kg	M	3.57E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(k)fluoranthene	3.30E-01	mg/kg	3.30E-01	mg/kg	M	2.18E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Chrysene	7.50E-01	mg/kg	7.50E-01	mg/kg	M	4.96E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Dibenz(ah)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	1.45E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Indeno(123-cd)pyrene	3.60E-01	mg/kg	3.60E-01	mg/kg	M	2.38E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	bis(2-Ethylhexyl)phthalate	3.40E+01	mg/kg	3.40E+01	mg/kg	M	2.25E-05	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	1.E-03
	Polychlorinated Biphenyls	9.80E+01	mg/kg	9.80E+01	mg/kg	M	6.98E-05	mg/kg/day	2.00E-05	mg/kg-day	NA	NA	3.E+00
	Antimony	7.40E-01	mg/kg	7.40E-01	mg/kg	M	3.76E-08	mg/kg/day	4.00E-05	mg/kg-day	NA	NA	9.E-04
	Arsenic	6.60E+00	mg/kg	6.60E+00	mg/kg	M	1.01E-06	mg/kg/day	2.85E-04	mg/kg-day	NA	NA	4.E-03
	Barium	7.80E+01	mg/kg	7.80E+01	mg/kg	M	3.97E-06	mg/kg/day	3.50E-03	mg/kg-day	NA	NA	1.E-03
	Beryllium	4.00E-01	mg/kg	4.00E-01	mg/kg	M	2.03E-08	mg/kg/day	2.00E-05	mg/kg-day	NA	NA	1.E-03
	Cadmium (Food)	1.30E+00	mg/kg	1.30E+00	mg/kg	M	6.61E-08	mg/kg/day	2.50E-05	mg/kg-day	NA	NA	3.E-03
	Chromium VI (particulates)	2.60E+01	mg/kg	2.60E+01	mg/kg	M	1.32E-06	mg/kg/day	3.00E-05	mg/kg-day	NA	NA	4.E-02
	Copper	4.70E+01	mg/kg	4.70E+01	mg/kg	M	2.39E-06	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	1.E-04
	Lead	4.90E+02	mg/kg	4.90E+02	mg/kg	M	2.49E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Manganese	1.60E+02	mg/kg	1.60E+02	mg/kg	M	8.14E-06	mg/kg/day	3.50E-03	mg/kg-day	NA	NA	2.E-03
	Mercury	6.10E+00	mg/kg	6.10E+00	mg/kg	M	3.10E-07	mg/kg/day	7.00E-06	mg/kg-day	NA	NA	4.E-02
	Molybdenum	2.40E+00	mg/kg	2.40E+00	mg/kg	M	1.22E-07	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	2.E-05
	Nickel	2.30E+01	mg/kg	2.30E+01	mg/kg	M	1.17E-06	mg/kg/day	2.00E-04	mg/kg-day	NA	NA	6.E-03
	Vanadium	1.80E+01	mg/kg	1.80E+01	mg/kg	M	9.15E-07	mg/kg/day	1.40E-04	mg/kg-day	NA	NA	7.E-03
	Zinc	1.30E+02	mg/kg	1.30E+02	mg/kg	M	6.61E-06	mg/kg/day	7.50E-02	mg/kg-day	NA	NA	9.E-05
	(Total)												4.E+00
												Total Hazard Index Across Direct Exposure Routes/Pathways	3.E+01
												Total Hazard Index Across All Exposure Routes/Pathways	3.E+01

(1) Dioxin-like PCB and dioxin congeners are not shown on this table because we do not evaluate non-carcinogenic risk of these compounds.
(2) M indicates the Medium EPC was used while R indicates the Route EPC was used.
(3) All reference doses are chronic values.

TABLE 7.3.RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: 0 to 1 foot soil
Receptor Population: Resident
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (2)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (3)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient (4)
Soil Ingestion	1,2-Dichloroethene (cis)	4.00E-03	mg/kg	4.00E-03	mg/kg	M	2.50E-09	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	3.E-07
	para-Isopropyltoluene	8.40E-03	mg/kg	8.40E-03	mg/kg	M	5.26E-09	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Tetrachloroethene	2.30E+00	mg/kg	2.30E+00	mg/kg	M	1.44E-06	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	1.E-04
	1,2,4-Trimethylbenzene	4.80E+00	mg/kg	4.80E+00	mg/kg	M	3.01E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,3,5-Trimethylbenzene	5.30E+00	mg/kg	5.30E+00	mg/kg	M	3.32E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	C9-C18 Aliphatics	4.60E+03	mg/kg	4.60E+03	mg/kg	M	2.88E-03	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	3.E-02
	C11-C22 Aromatics	8.20E+03	mg/kg	8.20E+03	mg/kg	M	5.14E-03	mg/kg/day	3.00E-02	mg/kg-day	NA	NA	2.E-01
	Naphthalene	5.90E-01	mg/kg	5.90E-01	mg/kg	M	3.69E-07	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	2.E-05
	Benz(a)anthracene	3.70E+00	mg/kg	3.70E+00	mg/kg	M	2.32E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(a)pyrene	2.00E+00	mg/kg	2.00E+00	mg/kg	M	1.25E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(b)fluoranthene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	7.51E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(k)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	1.06E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Chrysene	2.10E+00	mg/kg	2.10E+00	mg/kg	M	1.32E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Dibenz(ah)anthracene	2.80E-01	mg/kg	2.80E-01	mg/kg	M	1.75E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Indeno(123-cd)pyrene	6.60E-01	mg/kg	6.60E-01	mg/kg	M	4.13E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	bis(2-Ethylhexyl)phthalate	1.30E+02	mg/kg	1.30E+02	mg/kg	M	8.14E-05	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	4.E-03
	Polychlorinated Biphenyls	3.80E+02	mg/kg	3.80E+02	mg/kg	M	2.38E-04	mg/kg/day	2.00E-05	mg/kg-day	NA	NA	1.E+01
	Antimony	6.20E-01	mg/kg	6.20E-01	mg/kg	M	3.88E-07	mg/kg/day	4.00E-04	mg/kg-day	NA	NA	1.E-03
	Arsenic	7.00E+00	mg/kg	7.00E+00	mg/kg	M	4.38E-06	mg/kg/day	3.00E-04	mg/kg-day	NA	NA	1.E-02
	Barium	3.20E+03	mg/kg	3.20E+03	mg/kg	M	2.00E-03	mg/kg/day	7.00E-02	mg/kg-day	NA	NA	3.E-02
	Beryllium	3.60E-01	mg/kg	3.60E-01	mg/kg	M	2.25E-07	mg/kg/day	2.00E-03	mg/kg-day	NA	NA	1.E-04
	Cadmium (Food)	2.30E+01	mg/kg	2.30E+01	mg/kg	M	1.44E-05	mg/kg/day	1.00E-03	mg/kg-day	NA	NA	1.E-02
	Chromium VI (particulates)	5.30E+02	mg/kg	5.30E+02	mg/kg	M	3.32E-04	mg/kg/day	3.00E-03	mg/kg-day	NA	NA	1.E-01
	Copper	2.10E+01	mg/kg	2.10E+01	mg/kg	M	1.32E-05	mg/kg/day	4.00E-02	mg/kg-day	NA	NA	3.E-04
	Lead	9.00E+02	mg/kg	9.00E+02	mg/kg	M	5.64E-04	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Manganese	2.60E+02	mg/kg	2.60E+02	mg/kg	M	1.63E-04	mg/kg/day	7.00E-02	mg/kg-day	NA	NA	2.E-03
	Mercury	3.00E-01	mg/kg	3.00E-01	mg/kg	M	1.88E-07	mg/kg/day	1.00E-04	mg/kg-day	NA	NA	2.E-03
	Molybdenum	3.60E+00	mg/kg	3.60E+00	mg/kg	M	2.25E-06	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	5.E-04
	Nickel	9.20E+02	mg/kg	9.20E+02	mg/kg	M	5.76E-04	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	3.E-02
	Vanadium	1.60E+01	mg/kg	1.60E+01	mg/kg	M	1.00E-05	mg/kg/day	7.00E-03	mg/kg-day	NA	NA	1.E-03
	Zinc	1.60E+03	mg/kg	1.60E+03	mg/kg	M	1.00E-03	mg/kg/day	3.00E-01	mg/kg-day	NA	NA	3.E-03
	(Total)												1.E+01
												Total Hazard Index Across Direct Exposure Routes/Pathways	6.E+01
												Total Hazard Index Across All Exposure Routes/Pathways	8.E+01

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (2)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (3)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient (4)
Soil	1,2-Dichloroethene (cis)	4.00E-03	mg/kg	4.00E-03	mg/kg	M	0.00E+00	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	---
Dermal	para-Isopropyltoluene	8.40E-03	mg/kg	8.40E-03	mg/kg	M	2.10E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Tetrachloroethene	2.30E+00	mg/kg	2.30E+00	mg/kg	M	0.00E+00	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	---
	1,2,4-Trimethylbenzene	4.80E+00	mg/kg	4.80E+00	mg/kg	M	1.20E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,3,5-Trimethylbenzene	5.30E+00	mg/kg	5.30E+00	mg/kg	M	1.32E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	C9-C18 Aliphatics	4.60E+03	mg/kg	4.60E+03	mg/kg	M	2.30E-03	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	2.E-02
	C11-C22 Aromatics	8.20E+03	mg/kg	8.20E+03	mg/kg	M	3.69E-03	mg/kg/day	3.00E-02	mg/kg-day	NA	NA	1.E-01
	Naphthalene	5.90E-01	mg/kg	5.90E-01	mg/kg	M	1.47E-06	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	7.E-05
	Benz(a)anthracene	3.70E+00	mg/kg	3.70E+00	mg/kg	M	1.20E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(a)pyrene	2.00E+00	mg/kg	2.00E+00	mg/kg	M	6.50E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(b)fluoranthene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	3.90E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(k)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	5.52E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Chrysene	2.10E+00	mg/kg	2.10E+00	mg/kg	M	6.82E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Dibenz(ah)anthracene	2.80E-01	mg/kg	2.80E-01	mg/kg	M	9.10E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Indeno(123-cd)pyrene	6.60E-01	mg/kg	6.60E-01	mg/kg	M	2.14E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	bis(2-Ethylhexyl)phthalate	1.30E+02	mg/kg	1.30E+02	mg/kg	M	4.22E-05	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	2.E-03
	Polychlorinated Biphenyls	3.80E+02	mg/kg	3.80E+02	mg/kg	M	1.33E-04	mg/kg/day	2.00E-05	mg/kg-day	NA	NA	7.E+00
	Antimony	6.20E-01	mg/kg	6.20E-01	mg/kg	M	1.55E-08	mg/kg/day	4.00E-05	mg/kg-day	NA	NA	4.E-04
	Arsenic	7.00E+00	mg/kg	7.00E+00	mg/kg	M	5.25E-07	mg/kg/day	2.85E-04	mg/kg-day	NA	NA	2.E-03
	Barium	3.20E+03	mg/kg	3.20E+03	mg/kg	M	8.00E-05	mg/kg/day	3.50E-03	mg/kg-day	NA	NA	2.E-02
	Beryllium	3.60E-01	mg/kg	3.60E-01	mg/kg	M	9.00E-09	mg/kg/day	2.00E-05	mg/kg-day	NA	NA	4.E-04
	Cadmium (Food)	2.30E+01	mg/kg	2.30E+01	mg/kg	M	5.75E-07	mg/kg/day	2.50E-05	mg/kg-day	NA	NA	2.E-02
	Chromium VI (particulates)	5.30E+02	mg/kg	5.30E+02	mg/kg	M	1.32E-05	mg/kg/day	3.00E-05	mg/kg-day	NA	NA	4.E-01
	Copper	2.10E+01	mg/kg	2.10E+01	mg/kg	M	5.25E-07	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	3.E-05
	Lead	9.00E+02	mg/kg	9.00E+02	mg/kg	M	2.25E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Manganese	2.60E+02	mg/kg	2.60E+02	mg/kg	M	6.50E-06	mg/kg/day	3.50E-03	mg/kg-day	NA	NA	2.E-03
	Mercury	3.00E-01	mg/kg	3.00E-01	mg/kg	M	7.50E-09	mg/kg/day	7.00E-06	mg/kg-day	NA	NA	1.E-03
	Molybdenum	3.60E+00	mg/kg	3.60E+00	mg/kg	M	9.00E-08	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	2.E-05
	Nickel	9.20E+02	mg/kg	9.20E+02	mg/kg	M	2.30E-05	mg/kg/day	2.00E-04	mg/kg-day	NA	NA	1.E-01
	Vanadium	1.60E+01	mg/kg	1.60E+01	mg/kg	M	4.00E-07	mg/kg/day	1.40E-04	mg/kg-day	NA	NA	3.E-03
	Zinc	1.60E+03	mg/kg	1.60E+03	mg/kg	M	4.00E-05	mg/kg/day	7.50E-02	mg/kg-day	NA	NA	5.E-04
	(Total)												7.E+00
												Total Hazard Index Across Direct Exposure Routes/Pathways	6.E+01
												Total Hazard Index Across All Exposure Routes/Pathways	8.E+01

(1) Dioxin-like PCB and dioxin congeners are not shown on this table because we do not evaluate non-carcinogenic risk of these compounds.
(2) M indicates the Medium EPC was used while R indicates the Route EPC was used.
(3) All reference doses are chronic values.
(4) The "Total Hazard Index Across Direct Exposure Routes/Pathways" is the HI for the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.
The "Total Hazard Index Across All Exposure Routes/Pathways" is the HI for the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.

TABLE 7.3.CT
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: 0 to 1 foot soil
Receptor Population: Resident
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (2)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (3)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient (4)
Soil Ingestion	1,2-Dichloroethene (cis)	4.00E-03	mg/kg	4.00E-03	mg/kg	M	1.25E-09	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	1.E-07
	para-Isopropyltoluene	8.40E-03	mg/kg	8.40E-03	mg/kg	M	2.63E-09	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Tetrachloroethene	1.60E-01	mg/kg	1.60E-01	mg/kg	M	5.01E-08	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	5.E-06
	1,2,4-Trimethylbenzene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	6.89E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,3,5-Trimethylbenzene	2.40E-01	mg/kg	2.40E-01	mg/kg	M	7.51E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	C9-C18 Aliphatics	4.80E+02	mg/kg	4.80E+02	mg/kg	M	1.50E-04	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	2.E-03
	C11-C22 Aromatics	8.80E+02	mg/kg	8.80E+02	mg/kg	M	2.76E-04	mg/kg/day	3.00E-02	mg/kg-day	NA	NA	9.E-03
	Naphthalene	7.10E-02	mg/kg	7.10E-02	mg/kg	M	2.22E-08	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	1.E-06
	Benz(a)anthracene	3.70E+00	mg/kg	3.70E+00	mg/kg	M	1.16E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(a)pyrene	4.70E-01	mg/kg	4.70E-01	mg/kg	M	1.47E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(b)fluoranthene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	3.76E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(k)fluoranthene	4.30E-01	mg/kg	4.30E-01	mg/kg	M	1.35E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Chrysene	2.10E+00	mg/kg	2.10E+00	mg/kg	M	6.58E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Dibenz(ah)anthracene	2.80E-01	mg/kg	2.80E-01	mg/kg	M	8.77E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Indeno(123-cd)pyrene	6.60E-01	mg/kg	6.60E-01	mg/kg	M	2.07E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	bis(2-Ethylhexyl)phthalate	2.30E+01	mg/kg	2.30E+01	mg/kg	M	7.20E-06	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	4.E-04
	Polychlorinated Biphenyls	3.80E+02	mg/kg	3.80E+02	mg/kg	M	1.19E-04	mg/kg/day	2.00E-05	mg/kg-day	NA	NA	6.E+00
	Antimony	6.20E-01	mg/kg	6.20E-01	mg/kg	M	1.94E-07	mg/kg/day	4.00E-04	mg/kg-day	NA	NA	5.E-04
	Arsenic	7.00E+00	mg/kg	7.00E+00	mg/kg	M	2.19E-06	mg/kg/day	3.00E-04	mg/kg-day	NA	NA	7.E-03
	Barium	1.40E+02	mg/kg	1.40E+02	mg/kg	M	4.38E-05	mg/kg/day	7.00E-02	mg/kg-day	NA	NA	6.E-04
	Beryllium	3.60E-01	mg/kg	3.60E-01	mg/kg	M	1.13E-07	mg/kg/day	2.00E-03	mg/kg-day	NA	NA	6.E-05
	Cadmium (Food)	1.10E+00	mg/kg	1.10E+00	mg/kg	M	3.44E-07	mg/kg/day	1.00E-03	mg/kg-day	NA	NA	3.E-04
	Chromium VI (particulates)	3.10E+01	mg/kg	3.10E+01	mg/kg	M	9.71E-06	mg/kg/day	3.00E-03	mg/kg-day	NA	NA	3.E-03
	Copper	2.10E+01	mg/kg	2.10E+01	mg/kg	M	6.58E-06	mg/kg/day	4.00E-02	mg/kg-day	NA	NA	2.E-04
	Lead	9.00E+02	mg/kg	9.00E+02	mg/kg	M	2.82E-04	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Manganese	1.10E+02	mg/kg	1.10E+02	mg/kg	M	3.44E-05	mg/kg/day	7.00E-02	mg/kg-day	NA	NA	5.E-04
	Mercury	3.00E-01	mg/kg	3.00E-01	mg/kg	M	9.39E-08	mg/kg/day	1.00E-04	mg/kg-day	NA	NA	9.E-04
	Molybdenum	3.60E+00	mg/kg	3.60E+00	mg/kg	M	1.13E-06	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	2.E-04
	Nickel	3.80E+01	mg/kg	3.80E+01	mg/kg	M	1.19E-05	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	6.E-04
	Vanadium	1.60E+01	mg/kg	1.60E+01	mg/kg	M	5.01E-06	mg/kg/day	7.00E-03	mg/kg-day	NA	NA	7.E-04
	Zinc	1.00E+02	mg/kg	1.00E+02	mg/kg	M	3.13E-05	mg/kg/day	3.00E-01	mg/kg-day	NA	NA	1.E-04
	(Total)												6.E+00
												Total Hazard Index Across Direct Exposure Routes/Pathways	1.E+01
												Total Hazard Index Across All Exposure Routes/Pathways	1.E+01

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (2)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (3)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient (4)
Soil	1,2-Dichloroethene (cis)	4.00E-03	mg/kg	4.00E-03	mg/kg	M	0.00E+00	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	---
Dermal	para-Isopropyltoluene	8.40E-03	mg/kg	8.40E-03	mg/kg	M	3.00E-09	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Tetrachloroethene	1.60E-01	mg/kg	1.60E-01	mg/kg	M	0.00E+00	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	---
	1,2,4-Trimethylbenzene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	7.85E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,3,5-Trimethylbenzene	2.40E-01	mg/kg	2.40E-01	mg/kg	M	8.57E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	C9-C18 Aliphatics	4.80E+02	mg/kg	4.80E+02	mg/kg	M	3.43E-05	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	3.E-04
	C11-C22 Aromatics	8.80E+02	mg/kg	8.80E+02	mg/kg	M	5.65E-05	mg/kg/day	3.00E-02	mg/kg-day	NA	NA	2.E-03
	Naphthalene	7.10E-02	mg/kg	7.10E-02	mg/kg	M	2.53E-08	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	1.E-06
	Benz(a)anthracene	3.70E+00	mg/kg	3.70E+00	mg/kg	M	1.72E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(a)pyrene	4.70E-01	mg/kg	4.70E-01	mg/kg	M	2.18E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(b)fluoranthene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	5.57E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(k)fluoranthene	4.30E-01	mg/kg	4.30E-01	mg/kg	M	2.00E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Chrysene	2.10E+00	mg/kg	2.10E+00	mg/kg	M	9.74E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Dibenz(ah)anthracene	2.80E-01	mg/kg	2.80E-01	mg/kg	M	1.30E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Indeno(123-cd)pyrene	6.60E-01	mg/kg	6.60E-01	mg/kg	M	3.06E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	bis(2-Ethylhexyl)phthalate	2.30E+01	mg/kg	2.30E+01	mg/kg	M	1.07E-06	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	5.E-05
	Polychlorinated Biphenyls	3.80E+02	mg/kg	3.80E+02	mg/kg	M	1.90E-05	mg/kg/day	2.00E-05	mg/kg-day	NA	NA	9.E-01
	Antimony	6.20E-01	mg/kg	6.20E-01	mg/kg	M	2.21E-09	mg/kg/day	4.00E-05	mg/kg-day	NA	NA	6.E-05
	Arsenic	7.00E+00	mg/kg	7.00E+00	mg/kg	M	7.50E-08	mg/kg/day	2.85E-04	mg/kg-day	NA	NA	3.E-04
	Barium	1.40E+02	mg/kg	1.40E+02	mg/kg	M	5.00E-07	mg/kg/day	3.50E-03	mg/kg-day	NA	NA	1.E-04
	Beryllium	3.60E-01	mg/kg	3.60E-01	mg/kg	M	1.29E-09	mg/kg/day	2.00E-05	mg/kg-day	NA	NA	6.E-05
	Cadmium (Food)	1.10E+00	mg/kg	1.10E+00	mg/kg	M	3.93E-09	mg/kg/day	2.50E-05	mg/kg-day	NA	NA	2.E-04
	Chromium VI (particulates)	3.10E+01	mg/kg	3.10E+01	mg/kg	M	1.11E-07	mg/kg/day	3.00E-05	mg/kg-day	NA	NA	4.E-03
	Copper	2.10E+01	mg/kg	2.10E+01	mg/kg	M	7.50E-08	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	4.E-06
	Lead	9.00E+02	mg/kg	9.00E+02	mg/kg	M	3.21E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Manganese	1.10E+02	mg/kg	1.10E+02	mg/kg	M	3.93E-07	mg/kg/day	3.50E-03	mg/kg-day	NA	NA	1.E-04
	Mercury	3.00E-01	mg/kg	3.00E-01	mg/kg	M	1.07E-09	mg/kg/day	7.00E-06	mg/kg-day	NA	NA	2.E-04
	Molybdenum	3.60E+00	mg/kg	3.60E+00	mg/kg	M	1.29E-08	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	3.E-06
	Nickel	3.80E+01	mg/kg	3.80E+01	mg/kg	M	1.36E-07	mg/kg/day	2.00E-04	mg/kg-day	NA	NA	7.E-04
	Vanadium	1.60E+01	mg/kg	1.60E+01	mg/kg	M	5.71E-08	mg/kg/day	1.40E-04	mg/kg-day	NA	NA	4.E-04
	Zinc	1.00E+02	mg/kg	1.00E+02	mg/kg	M	3.57E-07	mg/kg/day	7.50E-02	mg/kg-day	NA	NA	5.E-06
	(Total)												1.E+00
												Total Hazard Index Across Direct Exposure Routes/Pathways	1.E+01
												Total Hazard Index Across All Exposure Routes/Pathways	1.E+01

(1) Dioxin-like PCB and dioxin congeners are not shown on this table because we do not evaluate non-carcinogenic risk of these compounds.
(2) M indicates the Medium EPC was used while R indicates the Route EPC was used.
(3) All reference doses are chronic values.
(4) The "Total Hazard Index Across Direct Exposure Routes/Pathways" is the HI for the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.
The "Total Hazard Index Across All Exposure Routes/Pathways" is the HI for the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.

TABLE 7.4.RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: 0 to 1 foot soil
Receptor Population: Resident
Receptor Age: Child

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (2)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (3)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Soil Ingestion	1,2-Dichloroethene (cis)	4.00E-03	mg/kg	4.00E-03	mg/kg	M	2.34E-08	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	2.E-06
	para-Isopropyltoluene	8.40E-03	mg/kg	8.40E-03	mg/kg	M	4.91E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Tetrachloroethene	2.30E+00	mg/kg	2.30E+00	mg/kg	M	1.34E-05	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	1.E-03
	1,2,4-Trimethylbenzene	4.80E+00	mg/kg	4.80E+00	mg/kg	M	2.81E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,3,5-Trimethylbenzene	5.30E+00	mg/kg	5.30E+00	mg/kg	M	3.10E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	C9-C18 Aliphatics	4.60E+03	mg/kg	4.60E+03	mg/kg	M	2.69E-02	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	3.E-01
	C11-C22 Aromatics	8.20E+03	mg/kg	8.20E+03	mg/kg	M	4.79E-02	mg/kg/day	3.00E-02	mg/kg-day	NA	NA	2.E+00
	Naphthalene	5.90E-01	mg/kg	5.90E-01	mg/kg	M	3.45E-06	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	2.E-04
	Benz(a)anthracene	3.70E+00	mg/kg	3.70E+00	mg/kg	M	2.16E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(a)pyrene	2.00E+00	mg/kg	2.00E+00	mg/kg	M	1.17E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(b)fluoranthene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	7.01E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(k)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	9.94E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Chrysene	2.10E+00	mg/kg	2.10E+00	mg/kg	M	1.23E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Dibenz(ah)anthracene	2.80E-01	mg/kg	2.80E-01	mg/kg	M	1.64E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Indeno(123-cd)pyrene	6.60E-01	mg/kg	6.60E-01	mg/kg	M	3.86E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	bis(2-Ethylhexyl)phthalate	1.30E+02	mg/kg	1.30E+02	mg/kg	M	7.60E-04	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	4.E-02
	Polychlorinated Biphenyls	3.80E+02	mg/kg	3.80E+02	mg/kg	M	2.22E-03	mg/kg/day	2.00E-05	mg/kg-day	NA	NA	1.E+02
	Antimony	6.20E-01	mg/kg	6.20E-01	mg/kg	M	3.62E-06	mg/kg/day	4.00E-04	mg/kg-day	NA	NA	9.E-03
	Arsenic	7.00E+00	mg/kg	7.00E+00	mg/kg	M	4.09E-05	mg/kg/day	3.00E-04	mg/kg-day	NA	NA	1.E-01
	Barium	3.20E+03	mg/kg	3.20E+03	mg/kg	M	1.87E-02	mg/kg/day	7.00E-02	mg/kg-day	NA	NA	3.E-01
	Beryllium	3.60E-01	mg/kg	3.60E-01	mg/kg	M	2.10E-06	mg/kg/day	2.00E-03	mg/kg-day	NA	NA	1.E-03
	Cadmium (Food)	2.30E+01	mg/kg	2.30E+01	mg/kg	M	1.34E-04	mg/kg/day	1.00E-03	mg/kg-day	NA	NA	1.E-01
	Chromium VI (particulates)	5.30E+02	mg/kg	5.30E+02	mg/kg	M	3.10E-03	mg/kg/day	3.00E-03	mg/kg-day	NA	NA	1.E+00
	Copper	2.10E+01	mg/kg	2.10E+01	mg/kg	M	1.23E-04	mg/kg/day	4.00E-02	mg/kg-day	NA	NA	3.E-03
	Lead	9.00E+02	mg/kg	9.00E+02	mg/kg	M	5.26E-03	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Manganese	2.60E+02	mg/kg	2.60E+02	mg/kg	M	1.52E-03	mg/kg/day	7.00E-02	mg/kg-day	NA	NA	2.E-02
	Mercury	3.00E-01	mg/kg	3.00E-01	mg/kg	M	1.75E-06	mg/kg/day	1.00E-04	mg/kg-day	NA	NA	2.E-02
	Molybdenum	3.60E+00	mg/kg	3.60E+00	mg/kg	M	2.10E-05	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	4.E-03
	Nickel	9.20E+02	mg/kg	9.20E+02	mg/kg	M	5.38E-03	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	3.E-01
	Vanadium	1.60E+01	mg/kg	1.60E+01	mg/kg	M	9.35E-05	mg/kg/day	7.00E-03	mg/kg-day	NA	NA	1.E-02
	Zinc	1.60E+03	mg/kg	1.60E+03	mg/kg	M	9.35E-03	mg/kg/day	3.00E-01	mg/kg-day	NA	NA	3.E-02
	(Total)												1.E+02
												Total Hazard Index Across Direct Exposure Routes/Pathways	3.E+02
												Total Hazard Index Across All Exposure Routes/Pathways	4.E+02

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (2)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (3)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Soil	1,2-Dichloroethene (cis)	4.00E-03	mg/kg	4.00E-03	mg/kg	M	0.00E+00	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	---
Dermal	para-Isopropyltoluene	8.40E-03	mg/kg	8.40E-03	mg/kg	M	1.42E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Tetrachloroethene	2.30E+00	mg/kg	2.30E+00	mg/kg	M	0.00E+00	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	---
	1,2,4-Trimethylbenzene	4.80E+00	mg/kg	4.80E+00	mg/kg	M	8.14E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,3,5-Trimethylbenzene	5.30E+00	mg/kg	5.30E+00	mg/kg	M	8.98E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	C9-C18 Aliphatics	4.60E+03	mg/kg	4.60E+03	mg/kg	M	1.56E-02	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	2.E-01
	C11-C22 Aromatics	8.20E+03	mg/kg	8.20E+03	mg/kg	M	2.50E-02	mg/kg/day	3.00E-02	mg/kg-day	NA	NA	8.E-01
	Naphthalene	5.90E-01	mg/kg	5.90E-01	mg/kg	M	1.00E-05	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	5.E-04
	Benz(a)anthracene	3.70E+00	mg/kg	3.70E+00	mg/kg	M	8.15E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(a)pyrene	2.00E+00	mg/kg	2.00E+00	mg/kg	M	4.41E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(b)fluoranthene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	2.64E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(k)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	3.75E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Chrysene	2.10E+00	mg/kg	2.10E+00	mg/kg	M	4.63E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Dibenz(ah)anthracene	2.80E-01	mg/kg	2.80E-01	mg/kg	M	6.17E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Indeno(123-cd)pyrene	6.60E-01	mg/kg	6.60E-01	mg/kg	M	1.45E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	bis(2-Ethylhexyl)phthalate	1.30E+02	mg/kg	1.30E+02	mg/kg	M	2.86E-04	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	1.E-02
	Polychlorinated Biphenyls	3.80E+02	mg/kg	3.80E+02	mg/kg	M	9.02E-04	mg/kg/day	2.00E-05	mg/kg-day	NA	NA	5.E+01
	Antimony	6.20E-01	mg/kg	6.20E-01	mg/kg	M	1.05E-07	mg/kg/day	4.00E-05	mg/kg-day	NA	NA	3.E-03
	Arsenic	7.00E+00	mg/kg	7.00E+00	mg/kg	M	3.56E-06	mg/kg/day	2.85E-04	mg/kg-day	NA	NA	1.E-02
	Barium	3.20E+03	mg/kg	3.20E+03	mg/kg	M	5.42E-04	mg/kg/day	3.50E-03	mg/kg-day	NA	NA	2.E-01
	Beryllium	3.60E-01	mg/kg	3.60E-01	mg/kg	M	6.10E-08	mg/kg/day	2.00E-05	mg/kg-day	NA	NA	3.E-03
	Cadmium (Food)	2.30E+01	mg/kg	2.30E+01	mg/kg	M	3.90E-06	mg/kg/day	2.50E-05	mg/kg-day	NA	NA	2.E-01
	Chromium VI (particulates)	5.30E+02	mg/kg	5.30E+02	mg/kg	M	8.98E-05	mg/kg/day	3.00E-05	mg/kg-day	NA	NA	3.E+00
	Copper	2.10E+01	mg/kg	2.10E+01	mg/kg	M	3.56E-06	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	2.E-04
	Lead	9.00E+02	mg/kg	9.00E+02	mg/kg	M	1.53E-04	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Manganese	2.60E+02	mg/kg	2.60E+02	mg/kg	M	4.41E-05	mg/kg/day	3.50E-03	mg/kg-day	NA	NA	1.E-02
	Mercury	3.00E-01	mg/kg	3.00E-01	mg/kg	M	5.08E-08	mg/kg/day	7.00E-06	mg/kg-day	NA	NA	7.E-03
	Molybdenum	3.60E+00	mg/kg	3.60E+00	mg/kg	M	6.10E-07	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	1.E-04
	Nickel	9.20E+02	mg/kg	9.20E+02	mg/kg	M	1.56E-04	mg/kg/day	2.00E-04	mg/kg-day	NA	NA	8.E-01
	Vanadium	1.60E+01	mg/kg	1.60E+01	mg/kg	M	2.71E-06	mg/kg/day	1.40E-04	mg/kg-day	NA	NA	2.E-02
	Zinc	1.60E+03	mg/kg	1.60E+03	mg/kg	M	2.71E-04	mg/kg/day	7.50E-02	mg/kg-day	NA	NA	4.E-03
	(Total)												5.E+01
												Total Hazard Index Across Direct Exposure Routes/Pathways	3.E+02
												Total Hazard Index Across All Exposure Routes/Pathways	4.E+02

(1) Dioxin-like PCB and dioxin congeners are not shown on this table because we do not evaluate non-carcinogenic risk of these compounds.
(2) M indicates the Medium EPC was used while R indicates the Route EPC was used.
(3) All reference doses are chronic values.
(4) The "Total Hazard Index Across Direct Exposure Routes/Pathways" is the HI for the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.
The "Total Hazard Index Across All Exposure Routes/Pathways" is the HI for the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.

TABLE 7.4.CT
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: 0 to 1 foot soil
Receptor Population: Resident
Receptor Age: Child

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (2)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (3)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Soil Ingestion	1,2-Dichloroethene (cis)	4.00E-03	mg/kg	4.00E-03	mg/kg	M	1.17E-08	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	1.E-06
	para-Isopropyltoluene	8.40E-03	mg/kg	8.40E-03	mg/kg	M	2.45E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Tetrachloroethene	1.60E-01	mg/kg	1.60E-01	mg/kg	M	4.68E-07	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	5.E-05
	1,2,4-Trimethylbenzene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	6.43E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,3,5-Trimethylbenzene	2.40E-01	mg/kg	2.40E-01	mg/kg	M	7.01E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	C9-C18 Aliphatics	4.80E+02	mg/kg	4.80E+02	mg/kg	M	1.40E-03	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	1.E-02
	C11-C22 Aromatics	8.80E+02	mg/kg	8.80E+02	mg/kg	M	2.57E-03	mg/kg/day	3.00E-02	mg/kg-day	NA	NA	9.E-02
	Naphthalene	7.10E-02	mg/kg	7.10E-02	mg/kg	M	2.07E-07	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	1.E-05
	Benz(a)anthracene	3.70E+00	mg/kg	3.70E+00	mg/kg	M	1.08E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(a)pyrene	4.70E-01	mg/kg	4.70E-01	mg/kg	M	1.37E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(b)fluoranthene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	3.51E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(k)fluoranthene	4.30E-01	mg/kg	4.30E-01	mg/kg	M	1.26E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Chrysene	2.10E+00	mg/kg	2.10E+00	mg/kg	M	6.14E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Dibenz(ah)anthracene	2.80E-01	mg/kg	2.80E-01	mg/kg	M	8.18E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Indeno(123-cd)pyrene	6.60E-01	mg/kg	6.60E-01	mg/kg	M	1.93E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	bis(2-Ethylhexyl)phthalate	2.30E+01	mg/kg	2.30E+01	mg/kg	M	6.72E-05	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	3.E-03
	Polychlorinated Biphenyls	3.80E+02	mg/kg	3.80E+02	mg/kg	M	1.11E-03	mg/kg/day	2.00E-05	mg/kg-day	NA	NA	6.E+01
	Antimony	6.20E-01	mg/kg	6.20E-01	mg/kg	M	1.81E-06	mg/kg/day	4.00E-04	mg/kg-day	NA	NA	5.E-03
	Arsenic	7.00E+00	mg/kg	7.00E+00	mg/kg	M	2.05E-05	mg/kg/day	3.00E-04	mg/kg-day	NA	NA	7.E-02
	Barium	1.40E+02	mg/kg	1.40E+02	mg/kg	M	4.09E-04	mg/kg/day	7.00E-02	mg/kg-day	NA	NA	6.E-03
	Beryllium	3.60E-01	mg/kg	3.60E-01	mg/kg	M	1.05E-06	mg/kg/day	2.00E-03	mg/kg-day	NA	NA	5.E-04
	Cadmium (Food)	1.10E+00	mg/kg	1.10E+00	mg/kg	M	3.21E-06	mg/kg/day	1.00E-03	mg/kg-day	NA	NA	3.E-03
	Chromium VI (particulates)	3.10E+01	mg/kg	3.10E+01	mg/kg	M	9.06E-05	mg/kg/day	3.00E-03	mg/kg-day	NA	NA	3.E-02
	Copper	2.10E+01	mg/kg	2.10E+01	mg/kg	M	6.14E-05	mg/kg/day	4.00E-02	mg/kg-day	NA	NA	2.E-03
	Lead	9.00E+02	mg/kg	9.00E+02	mg/kg	M	2.63E-03	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Manganese	1.10E+02	mg/kg	1.10E+02	mg/kg	M	3.21E-04	mg/kg/day	7.00E-02	mg/kg-day	NA	NA	5.E-03
	Mercury	3.00E-01	mg/kg	3.00E-01	mg/kg	M	8.77E-07	mg/kg/day	1.00E-04	mg/kg-day	NA	NA	9.E-03
	Molybdenum	3.60E+00	mg/kg	3.60E+00	mg/kg	M	1.05E-05	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	2.E-03
	Nickel	3.80E+01	mg/kg	3.80E+01	mg/kg	M	1.11E-04	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	6.E-03
	Vanadium	1.60E+01	mg/kg	1.60E+01	mg/kg	M	4.68E-05	mg/kg/day	7.00E-03	mg/kg-day	NA	NA	7.E-03
	Zinc	1.00E+02	mg/kg	1.00E+02	mg/kg	M	2.92E-04	mg/kg/day	3.00E-01	mg/kg-day	NA	NA	1.E-03
	(Total)												6.E+01
												Total Hazard Index Across Direct Exposure Routes/Pathways	8.E+01
												Total Hazard Index Across All Exposure Routes/Pathways	8.E+01

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (2)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (3)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Soil	1,2-Dichloroethene (cis)	4.00E-03	mg/kg	4.00E-03	mg/kg	M	0.00E+00	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	---
Dermal	para-Isopropyltoluene	8.40E-03	mg/kg	8.40E-03	mg/kg	M	4.27E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Tetrachloroethene	1.60E-01	mg/kg	1.60E-01	mg/kg	M	0.00E+00	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	---
	1,2,4-Trimethylbenzene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	1.12E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,3,5-Trimethylbenzene	2.40E-01	mg/kg	2.40E-01	mg/kg	M	1.22E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	C9-C18 Aliphatics	4.80E+02	mg/kg	4.80E+02	mg/kg	M	4.88E-04	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	5.E-03
	C11-C22 Aromatics	8.80E+02	mg/kg	8.80E+02	mg/kg	M	8.05E-04	mg/kg/day	3.00E-02	mg/kg-day	NA	NA	3.E-02
	Naphthalene	7.10E-02	mg/kg	7.10E-02	mg/kg	M	3.61E-07	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	2.E-05
	Benz(a)anthracene	3.70E+00	mg/kg	3.70E+00	mg/kg	M	2.45E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(a)pyrene	4.70E-01	mg/kg	4.70E-01	mg/kg	M	3.11E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(b)fluoranthene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	7.93E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(k)fluoranthene	4.30E-01	mg/kg	4.30E-01	mg/kg	M	2.84E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Chrysene	2.10E+00	mg/kg	2.10E+00	mg/kg	M	1.39E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Dibenz(ah)anthracene	2.80E-01	mg/kg	2.80E-01	mg/kg	M	1.85E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Indeno(123-cd)pyrene	6.60E-01	mg/kg	6.60E-01	mg/kg	M	4.36E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	bis(2-Ethylhexyl)phthalate	2.30E+01	mg/kg	2.30E+01	mg/kg	M	1.52E-05	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	8.E-04
	Polychlorinated Biphenyls	3.80E+02	mg/kg	3.80E+02	mg/kg	M	2.71E-04	mg/kg/day	2.00E-05	mg/kg-day	NA	NA	1.E+01
	Antimony	6.20E-01	mg/kg	6.20E-01	mg/kg	M	3.15E-08	mg/kg/day	4.00E-05	mg/kg-day	NA	NA	8.E-04
	Arsenic	7.00E+00	mg/kg	7.00E+00	mg/kg	M	1.07E-06	mg/kg/day	2.85E-04	mg/kg-day	NA	NA	4.E-03
	Barium	1.40E+02	mg/kg	1.40E+02	mg/kg	M	7.12E-06	mg/kg/day	3.50E-03	mg/kg-day	NA	NA	2.E-03
	Beryllium	3.60E-01	mg/kg	3.60E-01	mg/kg	M	1.83E-08	mg/kg/day	2.00E-05	mg/kg-day	NA	NA	9.E-04
	Cadmium (Food)	1.10E+00	mg/kg	1.10E+00	mg/kg	M	5.59E-08	mg/kg/day	2.50E-05	mg/kg-day	NA	NA	2.E-03
	Chromium VI (particulates)	3.10E+01	mg/kg	3.10E+01	mg/kg	M	1.58E-06	mg/kg/day	3.00E-05	mg/kg-day	NA	NA	5.E-02
	Copper	2.10E+01	mg/kg	2.10E+01	mg/kg	M	1.07E-06	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	5.E-05
	Lead	9.00E+02	mg/kg	9.00E+02	mg/kg	M	4.58E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Manganese	1.10E+02	mg/kg	1.10E+02	mg/kg	M	5.59E-06	mg/kg/day	3.50E-03	mg/kg-day	NA	NA	2.E-03
	Mercury	3.00E-01	mg/kg	3.00E-01	mg/kg	M	1.53E-08	mg/kg/day	7.00E-06	mg/kg-day	NA	NA	2.E-03
	Molybdenum	3.60E+00	mg/kg	3.60E+00	mg/kg	M	1.83E-07	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	4.E-05
	Nickel	3.80E+01	mg/kg	3.80E+01	mg/kg	M	1.93E-06	mg/kg/day	2.00E-04	mg/kg-day	NA	NA	1.E-02
	Vanadium	1.60E+01	mg/kg	1.60E+01	mg/kg	M	8.14E-07	mg/kg/day	1.40E-04	mg/kg-day	NA	NA	6.E-03
	Zinc	1.00E+02	mg/kg	1.00E+02	mg/kg	M	5.08E-06	mg/kg/day	7.50E-02	mg/kg-day	NA	NA	7.E-05
	(Total)												1.E+01
												Total Hazard Index Across Direct Exposure Routes/Pathways	8.E+01
												Total Hazard Index Across All Exposure Routes/Pathways	8.E+01

(1) Dioxin-like PCB and dioxin congeners are not shown on this table because we do not evaluate non-carcinogenic risk of these compounds.
(2) M indicates the Medium EPC was used while R indicates the Route EPC was used.
(3) All reference doses are chronic values.
(4) The "Total Hazard Index Across Direct Exposure Routes/Pathways" is the HI for the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.
The "Total Hazard Index Across All Exposure Routes/Pathways" is the HI for the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.

TABLE 7.5.RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Tap Water
Receptor Population: Resident
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient (3)
Drinking Water Ingestion	Benzene	2.40E-01	mg/L	2.40E-01	mg/L	M	6.58E-03	mg/kg/day	1.00E-03	mg/kg-day	NA	NA	7.E+00
	n-Butylbenzene	5.00E-03	mg/L	5.00E-03	mg/L	M	1.37E-04	mg/kg/day	NA	mg/kg-day	NA	NA	---
	sec-Butylbenzene	1.50E-02	mg/L	1.50E-02	mg/L	M	4.11E-04	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Chloroethane	2.30E-01	mg/L	2.30E-01	mg/L	M	6.30E-03	mg/kg/day	4.00E-01	mg/kg-day	NA	NA	2.E-02
	Chloromethane	5.00E-03	mg/L	5.00E-03	mg/L	M	1.37E-04	mg/kg/day	4.00E-03	mg/kg-day	NA	NA	3.E-02
	1,1-Dichloroethane	1.10E+00	mg/L	1.10E+00	mg/L	M	3.01E-02	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	3.E-01
	1,2-Dichloroethane	1.80E-02	mg/L	1.80E-02	mg/L	M	4.93E-04	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,1-Dichloroethene	1.20E-02	mg/L	1.20E-02	mg/L	M	3.29E-04	mg/kg/day	9.00E-03	mg/kg-day	NA	NA	4.E-02
	1,2-Dichloroethene (cis)	2.50E+00	mg/L	2.50E+00	mg/L	M	6.85E-02	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	7.E+00
	1,2-Dichloroethene (trans)	1.00E-01	mg/L	1.00E-01	mg/L	M	2.74E-03	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	1.E-01
	Ethylbenzene	9.40E-01	mg/L	9.40E-01	mg/L	M	2.58E-02	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	3.E-01
	para-Isopropyltoluene	1.50E-02	mg/L	1.50E-02	mg/L	M	4.11E-04	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Methylene Chloride	1.90E+00	mg/L	1.90E+00	mg/L	M	5.21E-02	mg/kg/day	6.00E-02	mg/kg-day	NA	NA	9.E-01
	Methyl-tert-butyl ether	1.20E-01	mg/L	1.20E-01	mg/L	M	3.29E-03	mg/kg/day	NA	mg/kg-day	NA	NA	---
	n-Propylbenzene	4.30E-02	mg/L	4.30E-02	mg/L	M	1.18E-03	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,1,2,2-Tetrachloroethane	1.90E-03	mg/L	1.90E-03	mg/L	M	5.21E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Tetrachloroethene	2.50E-02	mg/L	2.50E-02	mg/L	M	6.85E-04	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	7.E-02
	Toluene	5.50E-01	mg/L	5.50E-01	mg/L	M	1.51E-02	mg/kg/day	2.00E-01	mg/kg-day	NA	NA	8.E-02
	1,1,1-Trichloroethane	6.30E-01	mg/L	6.30E-01	mg/L	M	1.73E-02	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	9.E-01
	Trichloroethene	8.80E-01	mg/L	8.80E-01	mg/L	M	2.41E-02	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,2,4-Trimethylbenzene	4.60E-01	mg/L	4.60E-01	mg/L	M	1.26E-02	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,3,5-Trimethylbenzene	2.00E-01	mg/L	2.00E-01	mg/L	M	5.48E-03	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Vinyl Chloride	7.30E-01	mg/L	7.30E-01	mg/L	M	2.00E-02	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	4.E+00
	C9-C10 Aromatics	7.80E-01	mg/L	7.80E-01	mg/L	M	2.14E-02	mg/kg/day	4.00E-02	mg/kg-day	NA	NA	5.E-01
	C11-C22 Aromatics	2.20E-01	mg/L	2.20E-01	mg/L	M	6.03E-03	mg/kg/day	3.00E-02	mg/kg-day	NA	NA	2.E-01
	2-Methylnaphthalene	3.70E-02	mg/L	3.70E-02	mg/L	M	1.01E-03	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	5.E-02
	Naphthalene	2.10E-01	mg/L	2.10E-01	mg/L	M	5.75E-03	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	3.E-01
	1,2-Dichlorobenzene	2.20E-02	mg/L	2.20E-02	mg/L	M	6.03E-04	mg/kg/day	9.00E-02	mg/kg-day	NA	NA	7.E-03
	Aldrin	4.70E-05	mg/L	4.70E-05	mg/L	M	1.29E-06	mg/kg/day	3.00E-05	mg/kg-day	NA	NA	4.E-02
	alpha-BHC	2.60E-05	mg/L	2.60E-05	mg/L	M	7.12E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	gamma-BHC (Lindane)	7.60E-05	mg/L	7.60E-05	mg/L	M	2.08E-06	mg/kg/day	3.00E-04	mg/kg-day	NA	NA	7.E-03
	Dieldrin	4.70E-05	mg/L	4.70E-05	mg/L	M	1.29E-06	mg/kg/day	5.00E-05	mg/kg-day	NA	NA	3.E-02
	Heptachlor	4.10E-05	mg/L	4.10E-05	mg/L	M	1.12E-06	mg/kg/day	5.00E-04	mg/kg-day	NA	NA	2.E-03
	Heptachlor Epoxide	2.00E-05	mg/L	2.00E-05	mg/L	M	5.48E-07	mg/kg/day	1.30E-05	mg/kg-day	NA	NA	4.E-02
	Antimony	7.00E-03	mg/L	7.00E-03	mg/L	M	1.92E-04	mg/kg/day	4.00E-04	mg/kg-day	NA	NA	5.E-01
	Arsenic	2.80E-02	mg/L	2.80E-02	mg/L	M	7.67E-04	mg/kg/day	3.00E-04	mg/kg-day	NA	NA	3.E+00
	Barium	4.70E-01	mg/L	4.70E-01	mg/L	M	1.29E-02	mg/kg/day	7.00E-02	mg/kg-day	NA	NA	2.E-01
	Cadmium (Water)	8.00E-03	mg/L	8.00E-03	mg/L	M	2.19E-04	mg/kg/day	5.00E-04	mg/kg-day	NA	NA	4.E-01
	Chromium VI (aerosols)	6.40E-02	mg/L	6.40E-02	mg/L	M	1.75E-03	mg/kg/day	3.00E-03	mg/kg-day	NA	NA	6.E-01
	Manganese	6.40E+00	mg/L	6.40E+00	mg/L	M	1.75E-01	mg/kg/day	2.40E-02	mg/kg-day	NA	NA	7.E+00
	Nitrate	6.00E+00	mg/L	6.00E+00	mg/L	M	1.64E-01	mg/kg/day	1.60E+00	mg/kg-day	NA	NA	1.E-01
	Selenium	2.00E-02	mg/L	2.00E-02	mg/L	M	5.48E-04	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	1.E-01
	(Total)												3.E+01
												Total Hazard Index Across Direct Exposure Routes/Pathways	6.E+01
												Total Hazard Index Across All Exposure Routes/Pathways	8.E+01

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient (3)
Drinking Water Dermal	Benzene	2.40E-01	mg/L	2.40E-01	mg/L	M	6.56E-03	mg/kg/day	1.00E-03	mg/kg-day	NA	NA	7.E+00
	n-Butylbenzene	5.00E-03	mg/L	5.00E-03	mg/L	M	1.37E-04	mg/kg/day	NA	mg/kg-day	NA	NA	---
	sec-Butylbenzene	1.50E-02	mg/L	1.50E-02	mg/L	M	4.10E-04	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Chloroethane	2.30E-01	mg/L	2.30E-01	mg/L	M	4.57E-04	mg/kg/day	4.00E-01	mg/kg-day	NA	NA	1.E-03
	Chloromethane	5.00E-03	mg/L	5.00E-03	mg/L	M	5.22E-06	mg/kg/day	4.00E-03	mg/kg-day	NA	NA	1.E-03
	1,1-Dichloroethane	1.10E+00	mg/L	1.10E+00	mg/L	M	2.43E-03	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	2.E-02
	1,2-Dichloroethane	1.80E-02	mg/L	1.80E-02	mg/L	M	2.37E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,1-Dichloroethene	1.20E-02	mg/L	1.20E-02	mg/L	M	4.77E-05	mg/kg/day	9.00E-03	mg/kg-day	NA	NA	5.E-03
	1,2-Dichloroethene (cis)	2.50E+00	mg/L	2.50E+00	mg/L	M	6.22E-03	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	6.E-01
	1,2-Dichloroethene (trans)	1.00E-01	mg/L	1.00E-01	mg/L	M	2.49E-04	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	1.E-02
	Ethylbenzene	9.40E-01	mg/L	9.40E-01	mg/L	M	2.34E-01	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	2.E+00
	para-Isopropyltoluene	1.50E-02	mg/L	1.50E-02	mg/L	M	4.10E-04	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Methylene Chloride	1.90E+00	mg/L	1.90E+00	mg/L	M	2.13E-03	mg/kg/day	6.00E-02	mg/kg-day	NA	NA	4.E-02
	Methyl-tert-butyl ether	1.20E-01	mg/L	1.20E-01	mg/L	M	2.98E-02	mg/kg/day	NA	mg/kg-day	NA	NA	---
	n-Propylbenzene	4.30E-02	mg/L	4.30E-02	mg/L	M	1.18E-03	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,1,2,2-Tetrachloroethane	1.90E-03	mg/L	1.90E-03	mg/L	M	4.25E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Tetrachloroethene	2.50E-02	mg/L	2.50E-02	mg/L	M	2.30E-03	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	2.E-01
	Toluene	5.50E-01	mg/L	5.50E-01	mg/L	M	1.37E-01	mg/kg/day	2.00E-01	mg/kg-day	NA	NA	7.E-01
	1,1,1-Trichloroethane	6.30E-01	mg/L	6.30E-01	mg/L	M	2.66E-03	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	1.E-01
	Trichloroethene	8.80E-01	mg/L	8.80E-01	mg/L	M	5.03E-02	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,2,4-Trimethylbenzene	4.60E-01	mg/L	4.60E-01	mg/L	M	1.26E-02	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,3,5-Trimethylbenzene	2.00E-01	mg/L	2.00E-01	mg/L	M	5.47E-03	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Vinyl Chloride	7.30E-01	mg/L	7.30E-01	mg/L	M	1.32E-03	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	3.E-01
	C9-C10 Aromatics	7.80E-01	mg/L	7.80E-01	mg/L	M	1.34E-02	mg/kg/day	4.00E-02	mg/kg-day	NA	NA	3.E-01
	C11-C22 Aromatics	2.20E-01	mg/L	2.20E-01	mg/L	M	6.56E-02	mg/kg/day	3.00E-02	mg/kg-day	NA	NA	2.E+00
	2-Methylnaphthalene	3.70E-02	mg/L	3.70E-02	mg/L	M	6.35E-04	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	3.E-02
	Naphthalene	2.10E-01	mg/L	2.10E-01	mg/L	M	3.60E-03	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	2.E-01
	1,2-Dichlorobenzene	2.20E-02	mg/L	2.20E-02	mg/L	M	3.34E-04	mg/kg/day	9.00E-02	mg/kg-day	NA	NA	4.E-03
	Aldrin	4.70E-05	mg/L	4.70E-05	mg/L	M	1.87E-08	mg/kg/day	3.00E-05	mg/kg-day	NA	NA	6.E-04
	alpha-BHC	2.60E-05	mg/L	2.60E-05	mg/L	M	1.36E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	gamma-BHC (Lindane)	7.60E-05	mg/L	7.60E-05	mg/L	M	3.97E-06	mg/kg/day	3.00E-04	mg/kg-day	NA	NA	1.E-02
	Dieldrin	4.70E-05	mg/L	4.70E-05	mg/L	M	1.87E-07	mg/kg/day	5.00E-05	mg/kg-day	NA	NA	4.E-03
	Heptachlor	4.10E-05	mg/L	4.10E-05	mg/L	M	1.12E-07	mg/kg/day	5.00E-04	mg/kg-day	NA	NA	2.E-04
	Heptachlor Epoxide	2.00E-05	mg/L	2.00E-05	mg/L	M	5.47E-08	mg/kg/day	1.30E-05	mg/kg-day	NA	NA	4.E-03
	Antimony	7.00E-03	mg/L	7.00E-03	mg/L	M	1.74E-06	mg/kg/day	4.00E-05	mg/kg-day	NA	NA	4.E-02
	Arsenic	2.80E-02	mg/L	2.80E-02	mg/L	M	6.96E-06	mg/kg/day	2.85E-04	mg/kg-day	NA	NA	2.E-02
	Barium	4.70E-01	mg/L	4.70E-01	mg/L	M	1.17E-04	mg/kg/day	3.50E-03	mg/kg-day	NA	NA	3.E-02
	Cadmium (Water)	8.00E-03	mg/L	8.00E-03	mg/L	M	1.99E-06	mg/kg/day	2.50E-05	mg/kg-day	NA	NA	8.E-02
	Chromium VI (aerosols)	6.40E-02	mg/L	6.40E-02	mg/L	M	3.18E-05	mg/kg/day	3.00E-05	mg/kg-day	NA	NA	1.E+00
	Manganese	6.40E+00	mg/L	6.40E+00	mg/L	M	1.59E-03	mg/kg/day	1.20E-03	mg/kg-day	NA	NA	1.E+00
	Nitrate	6.00E+00	mg/L	6.00E+00	mg/L	M	1.49E-03	mg/kg/day	1.60E+00	mg/kg-day	NA	NA	9.E-04
	Selenium	2.00E-02	mg/L	2.00E-02	mg/L	M	4.97E-06	mg/kg/day	4.00E-03		NA	NA	1.E-03
	(Total)												2.E+01
												Total Hazard Index Across Direct Exposure Routes/Pathways	6.E+01
												Total Hazard Index Across All Exposure Routes/Pathways	8.E+01

(1) M indicates the Medium EPC was used while R indicates the Route EPC was used.
(2) All reference doses are chronic values.
(3) The "Total Hazard Index Across Direct Exposure Routes/Pathways" is the HI for the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.
The "Total Hazard Index Across All Exposure Routes/Pathways" is the HI for the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.
Both Total HI cells show the HI for an adult resident exposed to groundwater and 0 to 1 foot soil. The HI shown is higher than the HI for groundwater and 0 to 10 foot soil exposure.

TABLE 7.5.CT
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Tap Water
Receptor Population: Resident
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient (3)
Drinking Water Ingestion	Benzene	1.10E-02	mg/L	1.10E-02	mg/L	M	2.11E-04	mg/kg/day	1.00E-03	mg/kg-day	NA	NA	2.E-01
	n-Butylbenzene	1.50E-03	mg/L	1.50E-03	mg/L	M	2.88E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	sec-Butylbenzene	2.00E-03	mg/L	2.00E-03	mg/L	M	3.84E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Chloroethane	6.30E-03	mg/L	6.30E-03	mg/L	M	1.21E-04	mg/kg/day	4.00E-01	mg/kg-day	NA	NA	3.E-04
	Chloromethane	1.50E-03	mg/L	1.50E-03	mg/L	M	2.88E-05	mg/kg/day	4.00E-03	mg/kg-day	NA	NA	7.E-03
	1,1-Dichloroethane	2.80E-02	mg/L	2.80E-02	mg/L	M	5.37E-04	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	5.E-03
	1,2-Dichloroethane	2.00E-03	mg/L	2.00E-03	mg/L	M	3.84E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,1-Dichloroethene	1.70E-03	mg/L	1.70E-03	mg/L	M	3.26E-05	mg/kg/day	9.00E-03	mg/kg-day	NA	NA	4.E-03
	1,2-Dichloroethene (cis)	1.30E-01	mg/L	1.30E-01	mg/L	M	2.49E-03	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	2.E-01
	1,2-Dichloroethene (trans)	4.00E-03	mg/L	4.00E-03	mg/L	M	7.67E-05	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	4.E-03
	Ethylbenzene	2.50E-02	mg/L	2.50E-02	mg/L	M	4.79E-04	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	5.E-03
	para-Isopropyltoluene	1.90E-03	mg/L	1.90E-03	mg/L	M	3.64E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Methylene Chloride	2.60E-02	mg/L	2.60E-02	mg/L	M	4.99E-04	mg/kg/day	6.00E-02	mg/kg-day	NA	NA	8.E-03
	Methyl-tert-butyl ether	2.90E-03	mg/L	2.90E-03	mg/L	M	5.56E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	n-Propylbenzene	4.30E-03	mg/L	4.30E-03	mg/L	M	8.25E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,1,2,2-Tetrachloroethane	1.50E-03	mg/L	1.50E-03	mg/L	M	2.88E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Tetrachloroethene	3.40E-03	mg/L	3.40E-03	mg/L	M	6.52E-05	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	7.E-03
	Toluene	3.40E-02	mg/L	3.40E-02	mg/L	M	6.52E-04	mg/kg/day	2.00E-01	mg/kg-day	NA	NA	3.E-03
	1,1,1-Trichloroethane	3.50E-02	mg/L	3.50E-02	mg/L	M	6.71E-04	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	3.E-02
	Trichloroethene	2.20E-02	mg/L	2.20E-02	mg/L	M	4.22E-04	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,2,4-Trimethylbenzene	3.40E-02	mg/L	3.40E-02	mg/L	M	6.52E-04	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,3,5-Trimethylbenzene	1.40E-02	mg/L	1.40E-02	mg/L	M	2.68E-04	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Vinyl Chloride	1.70E-02	mg/L	1.70E-02	mg/L	M	3.26E-04	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	7.E-02
	C9-C10 Aromatics	2.20E-01	mg/L	2.20E-01	mg/L	M	4.22E-03	mg/kg/day	4.00E-02	mg/kg-day	NA	NA	1.E-01
	C11-C22 Aromatics	6.80E-02	mg/L	6.80E-02	mg/L	M	1.30E-03	mg/kg/day	3.00E-02	mg/kg-day	NA	NA	4.E-02
	2-Methylnaphthalene	1.00E-02	mg/L	1.00E-02	mg/L	M	1.92E-04	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	1.E-02
	Naphthalene	1.80E-02	mg/L	1.80E-02	mg/L	M	3.45E-04	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	2.E-02
	1,2-Dichlorobenzene	2.40E-03	mg/L	2.40E-03	mg/L	M	4.60E-05	mg/kg/day	9.00E-02	mg/kg-day	NA	NA	5.E-04
	Aldrin	1.50E-05	mg/L	1.50E-05	mg/L	M	2.88E-07	mg/kg/day	3.00E-05	mg/kg-day	NA	NA	1.E-02
	alpha-BHC	7.10E-06	mg/L	7.10E-06	mg/L	M	1.36E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	gamma-BHC (Lindane)	1.60E-05	mg/L	1.60E-05	mg/L	M	3.07E-07	mg/kg/day	3.00E-04	mg/kg-day	NA	NA	1.E-03
	Dieldrin	1.20E-05	mg/L	1.20E-05	mg/L	M	2.30E-07	mg/kg/day	5.00E-05	mg/kg-day	NA	NA	5.E-03
	Heptachlor	9.40E-06	mg/L	9.40E-06	mg/L	M	1.80E-07	mg/kg/day	5.00E-04	mg/kg-day	NA	NA	4.E-04
	Heptachlor Epoxide	6.10E-06	mg/L	6.10E-06	mg/L	M	1.17E-07	mg/kg/day	1.30E-05	mg/kg-day	NA	NA	9.E-03
	Antimony	3.10E-03	mg/L	3.10E-03	mg/L	M	5.95E-05	mg/kg/day	4.00E-04	mg/kg-day	NA	NA	1.E-01
	Arsenic	1.10E-02	mg/L	1.10E-02	mg/L	M	2.11E-04	mg/kg/day	3.00E-04	mg/kg-day	NA	NA	7.E-01
	Barium	1.00E-01	mg/L	1.00E-01	mg/L	M	1.92E-03	mg/kg/day	7.00E-02	mg/kg-day	NA	NA	3.E-02
	Cadmium (Water)	6.10E-04	mg/L	6.10E-04	mg/L	M	1.17E-05	mg/kg/day	5.00E-04	mg/kg-day	NA	NA	2.E-02
	Chromium VI (aerosols)	1.20E-02	mg/L	1.20E-02	mg/L	M	2.30E-04	mg/kg/day	3.00E-03	mg/kg-day	NA	NA	8.E-02
	Manganese	2.10E+00	mg/L	2.10E+00	mg/L	M	4.03E-02	mg/kg/day	2.40E-02	mg/kg-day	NA	NA	2.E+00
	Nitrate	2.50E-01	mg/L	2.50E-01	mg/L	M	4.79E-03	mg/kg/day	1.60E+00	mg/kg-day	NA	NA	3.E-03
	Selenium	5.30E-03	mg/L	5.30E-03	mg/L	M	1.02E-04	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	2.E-02
	(Total)												3.E+00
												Total Hazard Index Across Direct Exposure Routes/Pathways	1.E+01
												Total Hazard Index Across All Exposure Routes/Pathways	1.E+01

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient (3)
Drinking Water Dermal	Benzene	1.10E-02	mg/L	1.10E-02	mg/L	M	9.93E-05	mg/kg/day	1.00E-03	mg/kg-day	NA	NA	1.E-01
	n-Butylbenzene	1.50E-03	mg/L	1.50E-03	mg/L	M	1.35E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	sec-Butylbenzene	2.00E-03	mg/L	2.00E-03	mg/L	M	1.81E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Chloroethane	6.30E-03	mg/L	6.30E-03	mg/L	M	4.14E-06	mg/kg/day	4.00E-01	mg/kg-day	NA	NA	1.E-05
	Chloromethane	1.50E-03	mg/L	1.50E-03	mg/L	M	5.17E-07	mg/kg/day	4.00E-03	mg/kg-day	NA	NA	1.E-04
	1,1-Dichloroethane	2.80E-02	mg/L	2.80E-02	mg/L	M	2.04E-05	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	2.E-04
	1,2-Dichloroethane	2.00E-03	mg/L	2.00E-03	mg/L	M	8.70E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,1-Dichloroethene	1.70E-03	mg/L	1.70E-03	mg/L	M	2.23E-06	mg/kg/day	9.00E-03	mg/kg-day	NA	NA	2.E-04
	1,2-Dichloroethene (cis)	1.30E-01	mg/L	1.30E-01	mg/L	M	1.07E-04	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	1.E-02
	1,2-Dichloroethene (trans)	4.00E-03	mg/L	4.00E-03	mg/L	M	3.28E-06	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	2.E-04
	Ethylbenzene	2.50E-02	mg/L	2.50E-02	mg/L	M	2.05E-03	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	2.E-02
	para-Isopropyltoluene	1.90E-03	mg/L	1.90E-03	mg/L	M	1.71E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Methylene Chloride	2.60E-02	mg/L	2.60E-02	mg/L	M	9.60E-06	mg/kg/day	6.00E-02	mg/kg-day	NA	NA	2.E-04
	Methyl-tert-butyl ether	2.90E-03	mg/L	2.90E-03	mg/L	M	2.38E-04	mg/kg/day	NA	mg/kg-day	NA	NA	---
	n-Propylbenzene	4.30E-03	mg/L	4.30E-03	mg/L	M	3.88E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,1,2,2-Tetrachloroethane	1.50E-03	mg/L	1.50E-03	mg/L	M	1.11E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Tetrachloroethene	3.40E-03	mg/L	3.40E-03	mg/L	M	1.03E-04	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	1.E-02
	Toluene	3.40E-02	mg/L	3.40E-02	mg/L	M	2.79E-03	mg/kg/day	2.00E-01	mg/kg-day	NA	NA	1.E-02
	1,1,1-Trichloroethane	3.50E-02	mg/L	3.50E-02	mg/L	M	4.88E-05	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	2.E-03
	Trichloroethene	2.20E-02	mg/L	2.20E-02	mg/L	M	4.15E-04	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,2,4-Trimethylbenzene	3.40E-02	mg/L	3.40E-02	mg/L	M	3.07E-04	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,3,5-Trimethylbenzene	1.40E-02	mg/L	1.40E-02	mg/L	M	1.26E-04	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Vinyl Chloride	1.70E-02	mg/L	1.70E-02	mg/L	M	1.02E-05	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	2.E-03
	C9-C10 Aromatics	2.20E-01	mg/L	2.20E-01	mg/L	M	1.25E-03	mg/kg/day	4.00E-02	mg/kg-day	NA	NA	3.E-02
	C11-C22 Aromatics	6.80E-02	mg/L	6.80E-02	mg/L	M	6.70E-03	mg/kg/day	3.00E-02	mg/kg-day	NA	NA	2.E-01
	2-Methylnaphthalene	1.00E-02	mg/L	1.00E-02	mg/L	M	5.66E-05	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	3.E-03
	Naphthalene	1.80E-02	mg/L	1.80E-02	mg/L	M	1.02E-04	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	5.E-03
	1,2-Dichlorobenzene	2.40E-03	mg/L	2.40E-03	mg/L	M	1.20E-05	mg/kg/day	9.00E-02	mg/kg-day	NA	NA	1.E-04
	Aldrin	1.50E-05	mg/L	1.50E-05	mg/L	M	1.97E-09	mg/kg/day	3.00E-05	mg/kg-day	NA	NA	7.E-05
	alpha-BHC	7.10E-06	mg/L	7.10E-06	mg/L	M	1.22E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	gamma-BHC (Lindane)	1.60E-05	mg/L	1.60E-05	mg/L	M	2.76E-07	mg/kg/day	3.00E-04	mg/kg-day	NA	NA	9.E-04
	Dieldrin	1.20E-05	mg/L	1.20E-05	mg/L	M	1.58E-08	mg/kg/day	5.00E-05	mg/kg-day	NA	NA	3.E-04
	Heptachlor	9.40E-06	mg/L	9.40E-06	mg/L	M	8.48E-09	mg/kg/day	5.00E-04	mg/kg-day	NA	NA	2.E-05
	Heptachlor Epoxide	6.10E-06	mg/L	6.10E-06	mg/L	M	5.51E-09	mg/kg/day	1.30E-05	mg/kg-day	NA	NA	4.E-04
	Antimony	3.10E-03	mg/L	3.10E-03	mg/L	M	2.54E-07	mg/kg/day	4.00E-05	mg/kg-day	NA	NA	6.E-03
	Arsenic	1.10E-02	mg/L	1.10E-02	mg/L	M	9.03E-07	mg/kg/day	2.85E-04	mg/kg-day	NA	NA	3.E-03
	Barium	1.00E-01	mg/L	1.00E-01	mg/L	M	8.20E-06	mg/kg/day	3.50E-03	mg/kg-day	NA	NA	2.E-03
	Cadmium (Water)	6.10E-04	mg/L	6.10E-04	mg/L	M	5.00E-08	mg/kg/day	2.50E-05	mg/kg-day	NA	NA	2.E-03
	Chromium VI (aerosols)	1.20E-02	mg/L	1.20E-02	mg/L	M	1.97E-06	mg/kg/day	3.00E-05	mg/kg-day	NA	NA	7.E-02
	Manganese	2.10E+00	mg/L	2.10E+00	mg/L	M	1.72E-04	mg/kg/day	1.20E-03	mg/kg-day	NA	NA	1.E-01
	Nitrate	2.50E-01	mg/L	2.50E-01	mg/L	M	2.05E-05	mg/kg/day	1.60E+00	mg/kg-day	NA	NA	1.E-05
	Selenium	5.30E-03	mg/L	5.30E-03	mg/L	M	4.35E-07	mg/kg/day	4.00E-03	mg/kg-day	NA	NA	1.E-04
	(Total)												6.E-01
												Total Hazard Index Across Direct Exposure Routes/Pathways	1.E+01
												Total Hazard Index Across All Exposure Routes/Pathways	1.E+01

(1) M indicates the Medium EPC was used while R indicates the Route EPC was used.

(2) All reference doses are chronic values.

(3) The "Total Hazard Index Across Direct Exposure Routes/Pathways" is the HI for the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.
The "Total Hazard Index Across All Exposure Routes/Pathways" is the HI for the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.
Both Total HI cells show the HI for an adult resident exposed to groundwater and 0 to 1 foot soil. The HI shown is higher than the HI for groundwater and 0 to 10 foot soil exposure.

TABLE 7.6.RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Tap Water
Receptor Population: Resident
Receptor Age: Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient (3)
Drinking Water Ingestion	Benzene	2.40E-01	mg/L	2.40E-01	mg/L	M	2.30E-02	mg/kg/day	1.00E-03	mg/kg-day	NA	NA	2.E+01
	n-Butylbenzene	5.00E-03	mg/L	5.00E-03	mg/L	M	4.79E-04	mg/kg/day	NA	mg/kg-day	NA	NA	---
	sec-Butylbenzene	1.50E-02	mg/L	1.50E-02	mg/L	M	1.44E-03	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Chloroethane	2.30E-01	mg/L	2.30E-01	mg/L	M	2.21E-02	mg/kg/day	4.00E-01	mg/kg-day	NA	NA	6.E-02
	Chloromethane	5.00E-03	mg/L	5.00E-03	mg/L	M	4.79E-04	mg/kg/day	4.00E-03	mg/kg-day	NA	NA	1.E-01
	1,1-Dichloroethane	1.10E+00	mg/L	1.10E+00	mg/L	M	1.05E-01	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	1.E+00
	1,2-Dichloroethane	1.80E-02	mg/L	1.80E-02	mg/L	M	1.73E-03	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,1-Dichloroethene	1.20E-02	mg/L	1.20E-02	mg/L	M	1.15E-03	mg/kg/day	9.00E-03	mg/kg-day	NA	NA	1.E-01
	1,2-Dichloroethene (cis)	2.50E+00	mg/L	2.50E+00	mg/L	M	2.40E-01	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	2.E+01
	1,2-Dichloroethene (trans)	1.00E-01	mg/L	1.00E-01	mg/L	M	9.59E-03	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	5.E-01
	Ethylbenzene	9.40E-01	mg/L	9.40E-01	mg/L	M	9.01E-02	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	9.E-01
	para-Isopropyltoluene	1.50E-02	mg/L	1.50E-02	mg/L	M	1.44E-03	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Methylene Chloride	1.90E+00	mg/L	1.90E+00	mg/L	M	1.82E-01	mg/kg/day	6.00E-02	mg/kg-day	NA	NA	3.E+00
	Methyl-tert-butyl ether	1.20E-01	mg/L	1.20E-01	mg/L	M	1.15E-02	mg/kg/day	NA	mg/kg-day	NA	NA	---
	n-Propylbenzene	4.30E-02	mg/L	4.30E-02	mg/L	M	4.12E-03	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,1,2,2-Tetrachloroethane	1.90E-03	mg/L	1.90E-03	mg/L	M	1.82E-04	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Tetrachloroethene	2.50E-02	mg/L	2.50E-02	mg/L	M	2.40E-03	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	2.E-01
	Toluene	5.50E-01	mg/L	5.50E-01	mg/L	M	5.27E-02	mg/kg/day	2.00E-01	mg/kg-day	NA	NA	3.E-01
	1,1,1-Trichloroethane	6.30E-01	mg/L	6.30E-01	mg/L	M	6.04E-02	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	3.E+00
	Trichloroethene	8.80E-01	mg/L	8.80E-01	mg/L	M	8.44E-02	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,2,4-Trimethylbenzene	4.60E-01	mg/L	4.60E-01	mg/L	M	4.41E-02	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,3,5-Trimethylbenzene	2.00E-01	mg/L	2.00E-01	mg/L	M	1.92E-02	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Vinyl Chloride	7.30E-01	mg/L	7.30E-01	mg/L	M	7.00E-02	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	1.E+01
	C9-C10 Aromatics	7.80E-01	mg/L	7.80E-01	mg/L	M	7.48E-02	mg/kg/day	4.00E-02	mg/kg-day	NA	NA	2.E+00
	C11-C22 Aromatics	2.20E-01	mg/L	2.20E-01	mg/L	M	2.11E-02	mg/kg/day	3.00E-02	mg/kg-day	NA	NA	7.E-01
	2-Methylnaphthalene	3.70E-02	mg/L	3.70E-02	mg/L	M	3.55E-03	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	2.E-01
	Naphthalene	2.10E-01	mg/L	2.10E-01	mg/L	M	2.01E-02	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	1.E+00
	1,2-Dichlorobenzene	2.20E-02	mg/L	2.20E-02	mg/L	M	2.11E-03	mg/kg/day	9.00E-02	mg/kg-day	NA	NA	2.E-02
	Aldrin	4.70E-05	mg/L	4.70E-05	mg/L	M	4.51E-06	mg/kg/day	3.00E-05	mg/kg-day	NA	NA	2.E-01
	alpha-BHC	2.60E-05	mg/L	2.60E-05	mg/L	M	2.49E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	gamma-BHC (Lindane)	7.60E-05	mg/L	7.60E-05	mg/L	M	7.29E-06	mg/kg/day	3.00E-04	mg/kg-day	NA	NA	2.E-02
	Dieldrin	4.70E-05	mg/L	4.70E-05	mg/L	M	4.51E-06	mg/kg/day	5.00E-05	mg/kg-day	NA	NA	9.E-02
	Heptachlor	4.10E-05	mg/L	4.10E-05	mg/L	M	3.93E-06	mg/kg/day	5.00E-04	mg/kg-day	NA	NA	8.E-03
	Heptachlor Epoxide	2.00E-05	mg/L	2.00E-05	mg/L	M	1.92E-06	mg/kg/day	1.30E-05	mg/kg-day	NA	NA	1.E-01
	Antimony	7.00E-03	mg/L	7.00E-03	mg/L	M	6.71E-04	mg/kg/day	4.00E-04	mg/kg-day	NA	NA	2.E+00
	Arsenic	2.80E-02	mg/L	2.80E-02	mg/L	M	2.68E-03	mg/kg/day	3.00E-04	mg/kg-day	NA	NA	9.E+00
	Barium	4.70E-01	mg/L	4.70E-01	mg/L	M	4.51E-02	mg/kg/day	7.00E-02	mg/kg-day	NA	NA	6.E-01
	Cadmium (Water)	8.00E-03	mg/L	8.00E-03	mg/L	M	7.67E-04	mg/kg/day	5.00E-04	mg/kg-day	NA	NA	2.E+00
	Chromium VI (aerosols)	6.40E-02	mg/L	6.40E-02	mg/L	M	6.14E-03	mg/kg/day	3.00E-03	mg/kg-day	NA	NA	2.E+00
	Manganese	6.40E+00	mg/L	6.40E+00	mg/L	M	6.14E-01	mg/kg/day	2.40E-02	mg/kg-day	NA	NA	3.E+01
	Nitrate	6.00E+00	mg/L	6.00E+00	mg/L	M	5.75E-01	mg/kg/day	1.60E+00	mg/kg-day	NA	NA	4.E-01
	Selenium	2.00E-02	mg/L	2.00E-02	mg/L	M	1.92E-03	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	4.E-01
	(Total)												1.E+02
												Total Hazard Index Across Direct Exposure Routes/Pathways	3.E+02
												Total Hazard Index Across All Exposure Routes/Pathways	4.E+02

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient (3)
Drinking Water Dermal	Benzene	2.40E-01	mg/L	2.40E-01	mg/L	M	1.16E-02	mg/kg/day	1.00E-03	mg/kg-day	NA	NA	1.E+01
	n-Butylbenzene	5.00E-03	mg/L	5.00E-03	mg/L	M	2.42E-04	mg/kg/day	NA	mg/kg-day	NA	NA	---
	sec-Butylbenzene	1.50E-02	mg/L	1.50E-02	mg/L	M	7.26E-04	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Chloroethane	2.30E-01	mg/L	2.30E-01	mg/L	M	8.09E-04	mg/kg/day	4.00E-01	mg/kg-day	NA	NA	2.E-03
	Chloromethane	5.00E-03	mg/L	5.00E-03	mg/L	M	9.24E-06	mg/kg/day	4.00E-03	mg/kg-day	NA	NA	2.E-03
	1,1-Dichloroethane	1.10E+00	mg/L	1.10E+00	mg/L	M	4.31E-03	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	4.E-02
	1,2-Dichloroethane	1.80E-02	mg/L	1.80E-02	mg/L	M	4.20E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,1-Dichloroethene	1.20E-02	mg/L	1.20E-02	mg/L	M	8.44E-05	mg/kg/day	9.00E-03	mg/kg-day	NA	NA	9.E-03
	1,2-Dichloroethene (cis)	2.50E+00	mg/L	2.50E+00	mg/L	M	1.10E-02	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	1.E+00
	1,2-Dichloroethene (trans)	1.00E-01	mg/L	1.00E-01	mg/L	M	4.40E-04	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	2.E-02
	Ethylbenzene	9.40E-01	mg/L	9.40E-01	mg/L	M	4.13E-01	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	4.E+00
	para-Isopropyltoluene	1.50E-02	mg/L	1.50E-02	mg/L	M	7.26E-04	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Methylene Chloride	1.90E+00	mg/L	1.90E+00	mg/L	M	3.76E-03	mg/kg/day	6.00E-02	mg/kg-day	NA	NA	6.E-02
	Methyl-tert-butyl ether	1.20E-01	mg/L	1.20E-01	mg/L	M	5.28E-02	mg/kg/day	NA	mg/kg-day	NA	NA	---
	n-Propylbenzene	4.30E-02	mg/L	4.30E-02	mg/L	M	2.08E-03	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,1,2,2-Tetrachloroethane	1.90E-03	mg/L	1.90E-03	mg/L	M	7.52E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Tetrachloroethene	2.50E-02	mg/L	2.50E-02	mg/L	M	4.07E-03	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	4.E-01
	Toluene	5.50E-01	mg/L	5.50E-01	mg/L	M	2.42E-01	mg/kg/day	2.00E-01	mg/kg-day	NA	NA	1.E+00
	1,1,1-Trichloroethane	6.30E-01	mg/L	6.30E-01	mg/L	M	4.71E-03	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	2.E-01
	Trichloroethene	8.80E-01	mg/L	8.80E-01	mg/L	M	8.90E-02	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,2,4-Trimethylbenzene	4.60E-01	mg/L	4.60E-01	mg/L	M	2.23E-02	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,3,5-Trimethylbenzene	2.00E-01	mg/L	2.00E-01	mg/L	M	9.68E-03	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Vinyl Chloride	7.30E-01	mg/L	7.30E-01	mg/L	M	2.34E-03	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	5.E-01
	C9-C10 Aromatics	7.80E-01	mg/L	7.80E-01	mg/L	M	2.37E-02	mg/kg/day	4.00E-02	mg/kg-day	NA	NA	6.E-01
	C11-C22 Aromatics	2.20E-01	mg/L	2.20E-01	mg/L	M	1.16E-01	mg/kg/day	3.00E-02	mg/kg-day	NA	NA	4.E+00
	2-Methylnaphthalene	3.70E-02	mg/L	3.70E-02	mg/L	M	1.12E-03	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	6.E-02
	Naphthalene	2.10E-01	mg/L	2.10E-01	mg/L	M	6.37E-03	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	3.E-01
	1,2-Dichlorobenzene	2.20E-02	mg/L	2.20E-02	mg/L	M	5.90E-04	mg/kg/day	9.00E-02	mg/kg-day	NA	NA	7.E-03
	Aldrin	4.70E-05	mg/L	4.70E-05	mg/L	M	3.31E-08	mg/kg/day	3.00E-05	mg/kg-day	NA	NA	1.E-03
	alpha-BHC	2.60E-05	mg/L	2.60E-05	mg/L	M	2.40E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	gamma-BHC (Lindane)	7.60E-05	mg/L	7.60E-05	mg/L	M	7.02E-06	mg/kg/day	3.00E-04	mg/kg-day	NA	NA	2.E-02
	Dieldrin	4.70E-05	mg/L	4.70E-05	mg/L	M	3.31E-07	mg/kg/day	5.00E-05	mg/kg-day	NA	NA	7.E-03
	Heptachlor	4.10E-05	mg/L	4.10E-05	mg/L	M	1.98E-07	mg/kg/day	5.00E-04	mg/kg-day	NA	NA	4.E-04
	Heptachlor Epoxide	2.00E-05	mg/L	2.00E-05	mg/L	M	9.68E-08	mg/kg/day	1.30E-05	mg/kg-day	NA	NA	7.E-03
	Antimony	7.00E-03	mg/L	7.00E-03	mg/L	M	3.08E-06	mg/kg/day	4.00E-05	mg/kg-day	NA	NA	8.E-02
	Arsenic	2.80E-02	mg/L	2.80E-02	mg/L	M	1.23E-05	mg/kg/day	2.85E-04	mg/kg-day	NA	NA	4.E-02
	Barium	4.70E-01	mg/L	4.70E-01	mg/L	M	2.07E-04	mg/kg/day	3.50E-03	mg/kg-day	NA	NA	6.E-02
	Cadmium (Water)	8.00E-03	mg/L	8.00E-03	mg/L	M	3.52E-06	mg/kg/day	2.50E-05	mg/kg-day	NA	NA	1.E-01
	Chromium VI (aerosols)	6.40E-02	mg/L	6.40E-02	mg/L	M	5.63E-05	mg/kg/day	3.00E-05	mg/kg-day	NA	NA	2.E+00
	Manganese	6.40E+00	mg/L	6.40E+00	mg/L	M	2.81E-03	mg/kg/day	1.20E-03	mg/kg-day	NA	NA	2.E+00
	Nitrate	6.00E+00	mg/L	6.00E+00	mg/L	M	2.64E-03	mg/kg/day	1.60E+00	mg/kg-day	NA	NA	2.E-03
	Selenium	2.00E-02	mg/L	2.00E-02	mg/L	M	8.80E-06	mg/kg/day	4.00E-03	mg/kg-day	NA	NA	2.E-03
	(Total)												3.E+01
												Total Hazard Index Across Direct Exposure Routes/Pathways	3.E+02
												Total Hazard Index Across All Exposure Routes/Pathways	4.E+02

(1) M indicates the Medium EPC was used while R indicates the Route EPC was used.
(2) All reference doses are chronic values.
(3) The "Total Hazard Index Across Direct Exposure Routes/Pathways" is the HI for the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.
The "Total Hazard Index Across All Exposure Routes/Pathways" is the HI for the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.
Both Total HI cells show the HI for an adult resident exposed to groundwater and 0 to 1 foot soil. The HI shown is higher than the HI for groundwater and 0 to 10 foot soil exposure.

TABLE 7.6.CT
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Tap Water
Receptor Population: Resident
Receptor Age: Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient (3)
Drinking Water Ingestion	Benzene	1.10E-02	mg/L	1.10E-02	mg/L	M	6.12E-04	mg/kg/day	1.00E-03	mg/kg-day	NA	NA	6.E-01
	n-Butylbenzene	1.50E-03	mg/L	1.50E-03	mg/L	M	8.34E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	sec-Butylbenzene	2.00E-03	mg/L	2.00E-03	mg/L	M	1.11E-04	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Chloroethane	6.30E-03	mg/L	6.30E-03	mg/L	M	3.50E-04	mg/kg/day	4.00E-01	mg/kg-day	NA	NA	9.E-04
	Chloromethane	1.50E-03	mg/L	1.50E-03	mg/L	M	8.34E-05	mg/kg/day	4.00E-03	mg/kg-day	NA	NA	2.E-02
	1,1-Dichloroethane	2.80E-02	mg/L	2.80E-02	mg/L	M	1.56E-03	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	2.E-02
	1,2-Dichloroethane	2.00E-03	mg/L	2.00E-03	mg/L	M	1.11E-04	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,1-Dichloroethene	1.70E-03	mg/L	1.70E-03	mg/L	M	9.45E-05	mg/kg/day	9.00E-03	mg/kg-day	NA	NA	1.E-02
	1,2-Dichloroethene (cis)	1.30E-01	mg/L	1.30E-01	mg/L	M	7.23E-03	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	7.E-01
	1,2-Dichloroethene (trans)	4.00E-03	mg/L	4.00E-03	mg/L	M	2.22E-04	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	1.E-02
	Ethylbenzene	2.50E-02	mg/L	2.50E-02	mg/L	M	1.39E-03	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	1.E-02
	para-Isopropyltoluene	1.90E-03	mg/L	1.90E-03	mg/L	M	1.06E-04	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Methylene Chloride	2.60E-02	mg/L	2.60E-02	mg/L	M	1.45E-03	mg/kg/day	6.00E-02	mg/kg-day	NA	NA	2.E-02
	Methyl-tert-butyl ether	2.90E-03	mg/L	2.90E-03	mg/L	M	1.61E-04	mg/kg/day	NA	mg/kg-day	NA	NA	---
	n-Propylbenzene	4.30E-03	mg/L	4.30E-03	mg/L	M	2.39E-04	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,1,2,2-Tetrachloroethane	1.50E-03	mg/L	1.50E-03	mg/L	M	8.34E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Tetrachloroethene	3.40E-03	mg/L	3.40E-03	mg/L	M	1.89E-04	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	2.E-02
	Toluene	3.40E-02	mg/L	3.40E-02	mg/L	M	1.89E-03	mg/kg/day	2.00E-01	mg/kg-day	NA	NA	9.E-03
	1,1,1-Trichloroethane	3.50E-02	mg/L	3.50E-02	mg/L	M	1.95E-03	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	1.E-01
	Trichloroethene	2.20E-02	mg/L	2.20E-02	mg/L	M	1.22E-03	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,2,4-Trimethylbenzene	3.40E-02	mg/L	3.40E-02	mg/L	M	1.89E-03	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,3,5-Trimethylbenzene	1.40E-02	mg/L	1.40E-02	mg/L	M	7.79E-04	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Vinyl Chloride	1.70E-02	mg/L	1.70E-02	mg/L	M	9.45E-04	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	2.E-01
	C9-C10 Aromatics	2.20E-01	mg/L	2.20E-01	mg/L	M	1.22E-02	mg/kg/day	4.00E-02	mg/kg-day	NA	NA	3.E-01
	C11-C22 Aromatics	6.80E-02	mg/L	6.80E-02	mg/L	M	3.78E-03	mg/kg/day	3.00E-02	mg/kg-day	NA	NA	1.E-01
	2-Methylnaphthalene	1.00E-02	mg/L	1.00E-02	mg/L	M	5.56E-04	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	3.E-02
	Naphthalene	1.80E-02	mg/L	1.80E-02	mg/L	M	1.00E-03	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	5.E-02
	1,2-Dichlorobenzene	2.40E-03	mg/L	2.40E-03	mg/L	M	1.33E-04	mg/kg/day	9.00E-02	mg/kg-day	NA	NA	1.E-03
	Aldrin	1.50E-05	mg/L	1.50E-05	mg/L	M	8.34E-07	mg/kg/day	3.00E-05	mg/kg-day	NA	NA	3.E-02
	alpha-BHC	7.10E-06	mg/L	7.10E-06	mg/L	M	3.95E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	gamma-BHC (Lindane)	1.60E-05	mg/L	1.60E-05	mg/L	M	8.90E-07	mg/kg/day	3.00E-04	mg/kg-day	NA	NA	3.E-03
	Dieldrin	1.20E-05	mg/L	1.20E-05	mg/L	M	6.67E-07	mg/kg/day	5.00E-05	mg/kg-day	NA	NA	1.E-02
	Heptachlor	9.40E-06	mg/L	9.40E-06	mg/L	M	5.23E-07	mg/kg/day	5.00E-04	mg/kg-day	NA	NA	1.E-03
	Heptachlor Epoxide	6.10E-06	mg/L	6.10E-06	mg/L	M	3.39E-07	mg/kg/day	1.30E-05	mg/kg-day	NA	NA	3.E-02
	Antimony	3.10E-03	mg/L	3.10E-03	mg/L	M	1.72E-04	mg/kg/day	4.00E-04	mg/kg-day	NA	NA	4.E-01
	Arsenic	1.10E-02	mg/L	1.10E-02	mg/L	M	6.12E-04	mg/kg/day	3.00E-04	mg/kg-day	NA	NA	2.E+00
	Barium	1.00E-01	mg/L	1.00E-01	mg/L	M	5.56E-03	mg/kg/day	7.00E-02	mg/kg-day	NA	NA	8.E-02
	Cadmium (Water)	6.10E-04	mg/L	6.10E-04	mg/L	M	3.39E-05	mg/kg/day	5.00E-04	mg/kg-day	NA	NA	7.E-02
	Chromium VI (aerosols)	1.20E-02	mg/L	1.20E-02	mg/L	M	6.67E-04	mg/kg/day	3.00E-03	mg/kg-day	NA	NA	2.E-01
	Manganese	2.10E+00	mg/L	2.10E+00	mg/L	M	1.17E-01	mg/kg/day	2.40E-02	mg/kg-day	NA	NA	5.E+00
	Nitrate	2.50E-01	mg/L	2.50E-01	mg/L	M	1.39E-02	mg/kg/day	1.60E+00	mg/kg-day	NA	NA	9.E-03
	Selenium	5.30E-03	mg/L	5.30E-03	mg/L	M	2.95E-04	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	6.E-02
	(Total)												1.E+01
												Total Hazard Index Across Direct Exposure Routes/Pathways	8.E+01
												Total Hazard Index Across All Exposure Routes/Pathways	8.E+01

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient (3)
Drinking Water Dermal	Benzene	1.10E-02	mg/L	1.10E-02	mg/L	M	1.76E-04	mg/kg/day	1.00E-03	mg/kg-day	NA	NA	2.E-01
	n-Butylbenzene	1.50E-03	mg/L	1.50E-03	mg/L	M	2.39E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	sec-Butylbenzene	2.00E-03	mg/L	2.00E-03	mg/L	M	3.19E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Chloroethane	6.30E-03	mg/L	6.30E-03	mg/L	M	7.32E-06	mg/kg/day	4.00E-01	mg/kg-day	NA	NA	2.E-05
	Chloromethane	1.50E-03	mg/L	1.50E-03	mg/L	M	9.14E-07	mg/kg/day	4.00E-03	mg/kg-day	NA	NA	2.E-04
	1,1-Dichloroethane	2.80E-02	mg/L	2.80E-02	mg/L	M	3.62E-05	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	4.E-04
	1,2-Dichloroethane	2.00E-03	mg/L	2.00E-03	mg/L	M	1.54E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,1-Dichloroethene	1.70E-03	mg/L	1.70E-03	mg/L	M	3.95E-06	mg/kg/day	9.00E-03	mg/kg-day	NA	NA	4.E-04
	1,2-Dichloroethene (cis)	1.30E-01	mg/L	1.30E-01	mg/L	M	1.89E-04	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	2.E-02
	1,2-Dichloroethene (trans)	4.00E-03	mg/L	4.00E-03	mg/L	M	5.81E-06	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	3.E-04
	Ethylbenzene	2.50E-02	mg/L	2.50E-02	mg/L	M	3.63E-03	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	4.E-02
	para-Isopropyltoluene	1.90E-03	mg/L	1.90E-03	mg/L	M	3.03E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Methylene Chloride	2.60E-02	mg/L	2.60E-02	mg/L	M	1.70E-05	mg/kg/day	6.00E-02	mg/kg-day	NA	NA	3.E-04
	Methyl-tert-butyl ether	2.90E-03	mg/L	2.90E-03	mg/L	M	4.21E-04	mg/kg/day	NA	mg/kg-day	NA	NA	---
	n-Propylbenzene	4.30E-03	mg/L	4.30E-03	mg/L	M	6.87E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,1,2,2-Tetrachloroethane	1.50E-03	mg/L	1.50E-03	mg/L	M	1.96E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Tetrachloroethene	3.40E-03	mg/L	3.40E-03	mg/L	M	1.83E-04	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	2.E-02
	Toluene	3.40E-02	mg/L	3.40E-02	mg/L	M	4.93E-03	mg/kg/day	2.00E-01	mg/kg-day	NA	NA	2.E-02
	1,1,1-Trichloroethane	3.50E-02	mg/L	3.50E-02	mg/L	M	8.64E-05	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	4.E-03
	Trichloroethene	2.20E-02	mg/L	2.20E-02	mg/L	M	7.34E-04	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,2,4-Trimethylbenzene	3.40E-02	mg/L	3.40E-02	mg/L	M	5.43E-04	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,3,5-Trimethylbenzene	1.40E-02	mg/L	1.40E-02	mg/L	M	2.24E-04	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Vinyl Chloride	1.70E-02	mg/L	1.70E-02	mg/L	M	1.80E-05	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	4.E-03
	C9-C10 Aromatics	2.20E-01	mg/L	2.20E-01	mg/L	M	2.20E-03	mg/kg/day	4.00E-02	mg/kg-day	NA	NA	6.E-02
	C11-C22 Aromatics	6.80E-02	mg/L	6.80E-02	mg/L	M	1.18E-02	mg/kg/day	3.00E-02	mg/kg-day	NA	NA	4.E-01
	2-Methylnaphthalene	1.00E-02	mg/L	1.00E-02	mg/L	M	1.00E-04	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	5.E-03
	Naphthalene	1.80E-02	mg/L	1.80E-02	mg/L	M	1.80E-04	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	9.E-03
	1,2-Dichlorobenzene	2.40E-03	mg/L	2.40E-03	mg/L	M	2.12E-05	mg/kg/day	9.00E-02	mg/kg-day	NA	NA	2.E-04
	Aldrin	1.50E-05	mg/L	1.50E-05	mg/L	M	3.48E-09	mg/kg/day	3.00E-05	mg/kg-day	NA	NA	1.E-04
	alpha-BHC	7.10E-06	mg/L	7.10E-06	mg/L	M	2.16E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	gamma-BHC (Lindane)	1.60E-05	mg/L	1.60E-05	mg/L	M	4.88E-07	mg/kg/day	3.00E-04	mg/kg-day	NA	NA	2.E-03
	Dieldrin	1.20E-05	mg/L	1.20E-05	mg/L	M	2.79E-08	mg/kg/day	5.00E-05	mg/kg-day	NA	NA	6.E-04
	Heptachlor	9.40E-06	mg/L	9.40E-06	mg/L	M	1.50E-08	mg/kg/day	5.00E-04	mg/kg-day	NA	NA	3.E-05
	Heptachlor Epoxide	6.10E-06	mg/L	6.10E-06	mg/L	M	9.74E-09	mg/kg/day	1.30E-05	mg/kg-day	NA	NA	7.E-04
	Antimony	3.10E-03	mg/L	3.10E-03	mg/L	M	4.50E-07	mg/kg/day	4.00E-05	mg/kg-day	NA	NA	1.E-02
	Arsenic	1.10E-02	mg/L	1.10E-02	mg/L	M	1.60E-06	mg/kg/day	2.85E-04	mg/kg-day	NA	NA	6.E-03
	Barium	1.00E-01	mg/L	1.00E-01	mg/L	M	1.45E-05	mg/kg/day	3.50E-03	mg/kg-day	NA	NA	4.E-03
	Cadmium (Water)	6.10E-04	mg/L	6.10E-04	mg/L	M	8.85E-08	mg/kg/day	2.50E-05	mg/kg-day	NA	NA	4.E-03
	Chromium VI (aerosols)	1.20E-02	mg/L	1.20E-02	mg/L	M	3.48E-06	mg/kg/day	3.00E-05	mg/kg-day	NA	NA	1.E-01
	Manganese	2.10E+00	mg/L	2.10E+00	mg/L	M	3.05E-04	mg/kg/day	1.20E-03	mg/kg-day	NA	NA	3.E-01
	Nitrate	2.50E-01	mg/L	2.50E-01	mg/L	M	3.63E-05	mg/kg/day	1.60E+00	mg/kg-day	NA	NA	2.E-05
	Selenium	5.30E-03	mg/L	5.30E-03	mg/L	M	7.69E-07	mg/kg/day	4.00E-03	mg/kg-day	NA	NA	2.E-04
	(Total)												1.E+00
												Total Hazard Index Across Direct Exposure Routes/Pathways	8.E+01
												Total Hazard Index Across All Exposure Routes/Pathways	8.E+01

(1) M indicates the Medium EPC was used while R indicates the Route EPC was used.
(2) All reference doses are chronic values.

TABLE 7.7.RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Tap Water
Receptor Population: Resident
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient (3)
Drinking Water Ingestion	Benzene	5.20E-04	mg/L	5.20E-04	mg/L	M	1.42E-05	mg/kg/day	1.00E-03	mg/kg-day	NA	NA	1.E-02
	1,2-Dichloroethane	1.10E-03	mg/L	1.10E-03	mg/L	M	3.01E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,2-Dichloroethene (cis)	2.90E-02	mg/L	2.90E-02	mg/L	M	7.95E-04	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	8.E-02
	Trichloroethene	4.10E-03	mg/L	4.10E-03	mg/L	M	1.12E-04	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Vinyl Chloride	2.10E-03	mg/L	2.10E-03	mg/L	M	5.75E-05	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	1.E-02
	Heptachlor	1.70E-06	mg/L	1.70E-06	mg/L	M	4.66E-08	mg/kg/day	5.00E-04	mg/kg-day	NA	NA	9.E-05
	(Total)												1.E-01
Drinking Water Dermal	Benzene	5.20E-04	mg/L	5.20E-04	mg/L	M	1.42E-05	mg/kg/day	1.00E-03	mg/kg-day	NA	NA	1.E-02
	1,2-Dichloroethane	1.10E-03	mg/L	1.10E-03	mg/L	M	1.45E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,2-Dichloroethene (cis)	2.90E-02	mg/L	2.90E-02	mg/L	M	7.21E-05	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	7.E-03
	Trichloroethene	4.10E-03	mg/L	4.10E-03	mg/L	M	2.34E-04	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Vinyl Chloride	2.10E-03	mg/L	2.10E-03	mg/L	M	3.81E-06	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	8.E-04
	Heptachlor	1.70E-06	mg/L	1.70E-06	mg/L	M	4.65E-09	mg/kg/day	5.00E-04	mg/kg-day	NA	NA	9.E-06
	(Total)												2.E-02
												Total Hazard Index Across Direct Exposure Routes/Pathways	1.E-01
												Total Hazard Index Across All Exposure Routes/Pathways	2.E-01

(1) M indicates the Medium EPC was used while R indicates the Route EPC was used.
(2) All reference doses are chronic values.
(3) The "Total Hazard Index Across Direct Exposure Routes/Pathways" is the HI for the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.
The "Total Hazard Index Across All Exposure Routes/Pathways" is the HI for the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.

TABLE 7.7.CT
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Tap Water
Receptor Population: Resident
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient (3)
Drinking Water Ingestion	Benzene	3.90E-04	mg/L	3.90E-04	mg/L	M	7.48E-06	mg/kg/day	1.00E-03	mg/kg-day	NA	NA	7.E-03
	1,2-Dichloroethane	6.50E-04	mg/L	6.50E-04	mg/L	M	1.25E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,2-Dichloroethene (cis)	2.00E-02	mg/L	2.00E-02	mg/L	M	3.84E-04	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	4.E-02
	Trichloroethene	2.60E-03	mg/L	2.60E-03	mg/L	M	4.99E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Vinyl Chloride	1.20E-03	mg/L	1.20E-03	mg/L	M	2.30E-05	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	5.E-03
	Heptachlor	1.50E-06	mg/L	1.50E-06	mg/L	M	2.88E-08	mg/kg/day	5.00E-04	mg/kg-day	NA	NA	6.E-05
	(Total)												5.E-02
Drinking Water Dermal	Benzene	3.90E-04	mg/L	3.90E-04	mg/L	M	3.52E-06	mg/kg/day	1.00E-03	mg/kg-day	NA	NA	4.E-03
	1,2-Dichloroethane	6.50E-04	mg/L	6.50E-04	mg/L	M	2.83E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,2-Dichloroethene (cis)	2.00E-02	mg/L	2.00E-02	mg/L	M	1.64E-05	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	2.E-03
	Trichloroethene	2.60E-03	mg/L	2.60E-03	mg/L	M	4.91E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Vinyl Chloride	1.20E-03	mg/L	1.20E-03	mg/L	M	7.19E-07	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	1.E-04
	Heptachlor	1.50E-06	mg/L	1.50E-06	mg/L	M	1.35E-09	mg/kg/day	5.00E-04	mg/kg-day	NA	NA	3.E-06
	(Total)												5.E-03
												Total Hazard Index Across Direct Exposure Routes/Pathways	6.E-02
												Total Hazard Index Across All Exposure Routes/Pathways	1.E-01

(1) M indicates the Medium EPC was used while R indicates the Route EPC was used.
(2) All reference doses are chronic values.
(3) The "Total Hazard Index Across Direct Exposure Routes/Pathways" is the HI for the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.
The "Total Hazard Index Across All Exposure Routes/Pathways" is the HI for the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.

TABLE 7.8.RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Tap Water
Receptor Population: Resident
Receptor Age: Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient (3)
Drinking Water Ingestion	Benzene	5.20E-04	mg/L	5.20E-04	mg/L	M	4.99E-05	mg/kg/day	1.00E-03	mg/kg-day	NA	NA	5.E-02
	1,2-Dichloroethane	1.10E-03	mg/L	1.10E-03	mg/L	M	1.05E-04	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,2-Dichloroethene (cis)	2.90E-02	mg/L	2.90E-02	mg/L	M	2.78E-03	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	3.E-01
	Trichloroethene	4.10E-03	mg/L	4.10E-03	mg/L	M	3.93E-04	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Vinyl Chloride	2.10E-03	mg/L	2.10E-03	mg/L	M	2.01E-04	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	4.E-02
	Heptachlor	1.70E-06	mg/L	1.70E-06	mg/L	M	1.63E-07	mg/kg/day	5.00E-04	mg/kg-day	NA	NA	3.E-04
	(Total)												4.E-01
Drinking Water Dermal	Benzene	5.20E-04	mg/L	5.20E-04	mg/L	M	2.52E-05	mg/kg/day	1.00E-03	mg/kg-day	NA	NA	3.E-02
	1,2-Dichloroethane	1.10E-03	mg/L	1.10E-03	mg/L	M	2.56E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,2-Dichloroethene (cis)	2.90E-02	mg/L	2.90E-02	mg/L	M	1.28E-04	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	1.E-02
	Trichloroethene	4.10E-03	mg/L	4.10E-03	mg/L	M	4.15E-04	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Vinyl Chloride	2.10E-03	mg/L	2.10E-03	mg/L	M	6.74E-06	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	1.E-03
	Heptachlor	1.70E-06	mg/L	1.70E-06	mg/L	M	8.22E-09	mg/kg/day	5.00E-04	mg/kg-day	NA	NA	2.E-05
	(Total)												4.E-02
												Total Hazard Index Across Direct Exposure Routes/Pathways	4.E-01
												Total Hazard Index Across All Exposure Routes/Pathways	8.E-01

(1) M indicates the Medium EPC was used while R indicates the Route EPC was used.
(2) All reference doses are chronic values.
(3) The "Total Hazard Index Across Direct Exposure Routes/Pathways" is the HI for the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.
The "Total Hazard Index Across All Exposure Routes/Pathways" is the HI for the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.

TABLE 7.8.CT
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Tap Water
Receptor Population: Resident
Receptor Age: Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient (3)
Drinking Water Ingestion	Benzene	3.90E-04	mg/L	3.90E-04	mg/L	M	2.17E-05	mg/kg/day	1.00E-03	mg/kg-day	NA	NA	2.E-02
	1,2-Dichloroethane	6.50E-04	mg/L	6.50E-04	mg/L	M	3.62E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,2-Dichloroethene (cis)	2.00E-02	mg/L	2.00E-02	mg/L	M	1.11E-03	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	1.E-01
	Trichloroethene	2.60E-03	mg/L	2.60E-03	mg/L	M	1.45E-04	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Vinyl Chloride	1.20E-03	mg/L	1.20E-03	mg/L	M	6.67E-05	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	1.E-02
	Heptachlor	1.50E-06	mg/L	1.50E-06	mg/L	M	8.34E-08	mg/kg/day	5.00E-04	mg/kg-day	NA	NA	2.E-04
	(Total)												1.E-01
Drinking Water Dermal	Benzene	3.90E-04	mg/L	3.90E-04	mg/L	M	6.23E-06	mg/kg/day	1.00E-03	mg/kg-day	NA	NA	6.E-03
	1,2-Dichloroethane	6.50E-04	mg/L	6.50E-04	mg/L	M	5.00E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,2-Dichloroethene (cis)	2.00E-02	mg/L	2.00E-02	mg/L	M	2.90E-05	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	3.E-03
	Trichloroethene	2.60E-03	mg/L	2.60E-03	mg/L	M	8.68E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Vinyl Chloride	1.20E-03	mg/L	1.20E-03	mg/L	M	1.27E-06	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	3.E-04
	Heptachlor	1.50E-06	mg/L	1.50E-06	mg/L	M	2.39E-09	mg/kg/day	5.00E-04	mg/kg-day	NA	NA	5.E-06
	(Total)												9.E-03
												Total Hazard Index Across Direct Exposure Routes/Pathways	2.E-01
												Total Hazard Index Across All Exposure Routes/Pathways	3.E-01

(1) M indicates the Medium EPC was used while R indicates the Route EPC was used.
(2) All reference doses are chronic values.
(3) The "Total Hazard Index Across Direct Exposure Routes/Pathways" is the HI for the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.
The "Total Hazard Index Across All Exposure Routes/Pathways" is the HI for the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.

TABLE 7.9.RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Kelley Brook and adjacent wetlands
Receptor Population: Fisherperson
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient (3)
Surface Water Ingestion	1,2-Dichloroethene (cis)	1.10E-02	mg/L	1.10E-02	mg/L	M	1.38E-06	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	1.E-04
	Vinyl Chloride	3.00E-03	mg/L	3.00E-03	mg/L	M	3.76E-07	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	8.E-05
	Benz(a)anthracene	3.90E-04	mg/L	3.90E-04	mg/L	M	4.88E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(a)pyrene	4.40E-04	mg/L	4.40E-04	mg/L	M	5.51E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(b)fluoranthene	4.10E-04	mg/L	4.10E-04	mg/L	M	5.14E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(k)fluoranthene	3.50E-04	mg/L	3.50E-04	mg/L	M	4.38E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Chrysene	4.20E-04	mg/L	4.20E-04	mg/L	M	5.26E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Dibenz(ah)anthracene	6.10E-05	mg/L	6.10E-05	mg/L	M	7.64E-09	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Indeno(123-cd)pyrene	4.20E-04	mg/L	4.20E-04	mg/L	M	5.26E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Heptachlor Epoxide	1.70E-06	mg/L	1.70E-06	mg/L	M	2.13E-10	mg/kg/day	1.30E-05	mg/kg-day	NA	NA	2.E-05
	Arsenic	3.80E-03	mg/L	3.80E-03	mg/L	M	4.76E-07	mg/kg/day	3.00E-04	mg/kg-day	NA	NA	2.E-03
	Manganese	1.20E+00	mg/L	1.20E+00	mg/L	M	1.50E-04	mg/kg/day	2.40E-02	mg/kg-day	NA	NA	6.E-03
	Molybdenum	4.90E-02	mg/L	4.90E-02	mg/L	M	6.14E-06	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	1.E-03
	(Total)												9.E-03
Surface Water Dermal	1,2-Dichloroethene (cis)	1.10E-02	mg/L	1.10E-02	mg/L	M	5.75E-06	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	6.E-04
	Vinyl Chloride	3.00E-03	mg/L	3.00E-03	mg/L	M	1.14E-06	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	2.E-04
	Benz(a)anthracene	3.90E-04	mg/L	3.90E-04	mg/L	M	1.65E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(a)pyrene	4.40E-04	mg/L	4.40E-04	mg/L	M	2.76E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(b)fluoranthene	4.10E-04	mg/L	4.10E-04	mg/L	M	2.57E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(k)fluoranthene	3.50E-04	mg/L	3.50E-04	mg/L	M	2.20E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Chrysene	4.20E-04	mg/L	4.20E-04	mg/L	M	1.78E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Dibenz(ah)anthracene	6.10E-05	mg/L	6.10E-05	mg/L	M	8.61E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Indeno(123-cd)pyrene	4.20E-04	mg/L	4.20E-04	mg/L	M	4.17E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Heptachlor Epoxide	1.70E-06	mg/L	1.70E-06	mg/L	M	9.77E-10	mg/kg/day	1.30E-05	mg/kg-day	NA	NA	8.E-05
	Arsenic	3.80E-03	mg/L	3.80E-03	mg/L	M	1.99E-07	mg/kg/day	2.85E-04	mg/kg-day	NA	NA	7.E-04
	Manganese	1.20E+00	mg/L	1.20E+00	mg/L	M	6.27E-05	mg/kg/day	1.20E-03	mg/kg-day	NA	NA	5.E-02
	Molybdenum	4.90E-02	mg/L	4.90E-02	mg/L	M	2.56E-06	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	5.E-04
	(Total)												5.E-02
												Total Hazard Index Across All Routes/Pathways	5.E+00

(1) M indicates the Medium EPC was used while R indicates the Route EPC was used.
(2) All reference doses are chronic values.
(3) The "Total Hazard Index Across All Exposure Routes/Pathways" is the HI for the following exposure pathways: surface water ingestion and dermal contact, sediment ingestion and dermal contact, and fish ingestion.

TABLE 7.9.CT
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Kelley Brook and adjacent wetlands
Receptor Population: Fisherperson
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient (3)
Surface Water Ingestion	1,2-Dichloroethene (cis)	2.80E-03	mg/L	2.80E-03	mg/L	M	1.21E-07	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	1.E-05
	Vinyl Chloride	1.30E-03	mg/L	1.30E-03	mg/L	M	5.60E-08	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	1.E-05
	Benz(a)anthracene	6.00E-05	mg/L	6.00E-05	mg/L	M	2.58E-09	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(a)pyrene	6.70E-05	mg/L	6.70E-05	mg/L	M	2.88E-09	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(b)fluoranthene	6.30E-05	mg/L	6.30E-05	mg/L	M	2.71E-09	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(k)fluoranthene	5.50E-05	mg/L	5.50E-05	mg/L	M	2.37E-09	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Chrysene	6.50E-05	mg/L	6.50E-05	mg/L	M	2.80E-09	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Dibenz(ah)anthracene	1.20E-05	mg/L	1.20E-05	mg/L	M	5.17E-10	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Indeno(123-cd)pyrene	6.50E-05	mg/L	6.50E-05	mg/L	M	2.80E-09	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Heptachlor Epoxide	9.60E-07	mg/L	9.60E-07	mg/L	M	4.13E-11	mg/kg/day	1.30E-05	mg/kg-day	NA	NA	3.E-06
	Arsenic	1.80E-03	mg/L	1.80E-03	mg/L	M	7.75E-08	mg/kg/day	3.00E-04	mg/kg-day	NA	NA	3.E-04
	Manganese	7.20E-01	mg/L	7.20E-01	mg/L	M	3.10E-05	mg/kg/day	2.40E-02	mg/kg-day	NA	NA	1.E-03
	Molybdenum	2.10E-02	mg/L	2.10E-02	mg/L	M	9.04E-07	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	2.E-04
	(Total)												2.E-03
Surface Water Dermal	1,2-Dichloroethene (cis)	2.80E-03	mg/L	2.80E-03	mg/L	M	2.52E-07	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	3.E-05
	Vinyl Chloride	1.30E-03	mg/L	1.30E-03	mg/L	M	8.53E-08	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	2.E-05
	Benz(a)anthracene	6.00E-05	mg/L	6.00E-05	mg/L	M	4.37E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(a)pyrene	6.70E-05	mg/L	6.70E-05	mg/L	M	7.22E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(b)fluoranthene	6.30E-05	mg/L	6.30E-05	mg/L	M	6.79E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(k)fluoranthene	5.50E-05	mg/L	5.50E-05	mg/L	M	5.93E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Chrysene	6.50E-05	mg/L	6.50E-05	mg/L	M	4.73E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Dibenz(ah)anthracene	1.20E-05	mg/L	1.20E-05	mg/L	M	2.91E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Indeno(123-cd)pyrene	6.50E-05	mg/L	6.50E-05	mg/L	M	1.11E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Heptachlor Epoxide	9.60E-07	mg/L	9.60E-07	mg/L	M	9.49E-11	mg/kg/day	1.30E-05	mg/kg-day	NA	NA	7.E-06
	Arsenic	1.80E-03	mg/L	1.80E-03	mg/L	M	1.62E-08	mg/kg/day	2.85E-04	mg/kg-day	NA	NA	6.E-05
	Manganese	7.20E-01	mg/L	7.20E-01	mg/L	M	6.47E-06	mg/kg/day	1.20E-03	mg/kg-day	NA	NA	5.E-03
	Molybdenum	2.10E-02	mg/L	2.10E-02	mg/L	M	1.89E-07	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	4.E-05
	(Total)												6.E-03
												Total Hazard Index Across All Routes/Pathways	4.E-01

(1) M indicates the Medium EPC was used while R indicates the Route EPC was used.
(2) All reference doses are chronic values.
(3) The "Total Hazard Index Across All Exposure Routes/Pathways" is the HI for the following exposure pathways: surface water ingestion and dermal contact, sediment ingestion and dermal contact, and fish ingestion.

TABLE 7.10.RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Kelley Brook and adjacent wetlands
Receptor Population: Fisherperson
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (2)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (3)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient (4)
Sediment Ingestion	Methyl-tert-butyl ether	7.50E-02	mg/kg	7.50E-02	mg/kg	M	1.88E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	C11-C22 Aromatics	1.10E+03	mg/kg	1.10E+03	mg/kg	M	2.76E-04	mg/kg/day	3.00E-02	mg/kg-day	NA	NA	9.E-03
	Benz(a)anthracene	1.10E-01	mg/kg	1.10E-01	mg/kg	M	2.76E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(a)pyrene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	3.26E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(b)fluoranthene	1.60E-01	mg/kg	1.60E-01	mg/kg	M	4.01E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(k)fluoranthene	1.50E-01	mg/kg	1.50E-01	mg/kg	M	3.76E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Chrysene	1.50E-01	mg/kg	1.50E-01	mg/kg	M	3.76E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Dibenz(ah)anthracene	3.00E-02	mg/kg	3.00E-02	mg/kg	M	7.51E-09	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Indeno(123-cd)pyrene	8.60E-02	mg/kg	8.60E-02	mg/kg	M	2.15E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Polychlorinated Biphenyls	3.50E+00	mg/kg	3.50E+00	mg/kg	M	8.77E-07	mg/kg/day	2.00E-05	mg/kg-day	NA	NA	4.E-02
	Arsenic	5.80E+01	mg/kg	5.80E+01	mg/kg	M	1.45E-05	mg/kg/day	3.00E-04	mg/kg-day	NA	NA	5.E-02
	Beryllium	1.50E+00	mg/kg	1.50E+00	mg/kg	M	3.76E-07	mg/kg/day	2.00E-03	mg/kg-day	NA	NA	2.E-04
	Chromium VI (particulates)	2.90E+01	mg/kg	2.90E+01	mg/kg	M	7.26E-06	mg/kg/day	3.00E-03	mg/kg-day	NA	NA	2.E-03
	Manganese	1.20E+04	mg/kg	1.20E+04	mg/kg	M	3.01E-03	mg/kg/day	7.00E-02	mg/kg-day	NA	NA	4.E-02
	Mercury	4.20E-01	mg/kg	4.20E-01	mg/kg	M	1.05E-07	mg/kg/day	1.00E-04	mg/kg-day	NA	NA	1.E-03
	Thallium	6.90E-01	mg/kg	6.90E-01	mg/kg	M	1.73E-07	mg/kg/day	8.00E-05	mg/kg-day	NA	NA	2.E-03
	(Total)												2.E-01
Sediment Dermal	Methyl-tert-butyl ether	7.50E-02	mg/kg	7.50E-02	mg/kg	M	5.70E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	C11-C22 Aromatics	1.10E+03	mg/kg	1.10E+03	mg/kg	M	1.51E-03	mg/kg/day	3.00E-02	mg/kg-day	NA	NA	5.E-02
	Benz(a)anthracene	1.10E-01	mg/kg	1.10E-01	mg/kg	M	1.09E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(a)pyrene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	1.29E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(b)fluoranthene	1.60E-01	mg/kg	1.60E-01	mg/kg	M	1.58E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(k)fluoranthene	1.50E-01	mg/kg	1.50E-01	mg/kg	M	1.48E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Chrysene	1.50E-01	mg/kg	1.50E-01	mg/kg	M	1.48E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Dibenz(ah)anthracene	3.00E-02	mg/kg	3.00E-02	mg/kg	M	2.97E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Indeno(123-cd)pyrene	8.60E-02	mg/kg	8.60E-02	mg/kg	M	8.50E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Polychlorinated Biphenyls	3.50E+00	mg/kg	3.50E+00	mg/kg	M	3.73E-06	mg/kg/day	2.00E-05	mg/kg-day	NA	NA	2.E-01
	Arsenic	5.80E+01	mg/kg	5.80E+01	mg/kg	M	1.32E-05	mg/kg/day	2.85E-04	mg/kg-day	NA	NA	5.E-02
	Beryllium	1.50E+00	mg/kg	1.50E+00	mg/kg	M	1.14E-07	mg/kg/day	2.00E-05	mg/kg-day	NA	NA	6.E-03
	Chromium VI (particulates)	2.90E+01	mg/kg	2.90E+01	mg/kg	M	2.21E-06	mg/kg/day	3.00E-05	mg/kg-day	NA	NA	7.E-02
	Manganese	1.20E+04	mg/kg	1.20E+04	mg/kg	M	9.13E-04	mg/kg/day	3.50E-03	mg/kg-day	NA	NA	3.E-01
	Mercury	4.20E-01	mg/kg	4.20E-01	mg/kg	M	3.19E-08	mg/kg/day	7.00E-06	mg/kg-day	NA	NA	5.E-03
	Thallium	6.90E-01	mg/kg	6.90E-01	mg/kg	M	5.25E-08	mg/kg/day	8.00E-05	mg/kg-day	NA	NA	7.E-04
	(Total)												6.E-01
												Total Hazard Index Across All Routes/Pathways	5.E+00

(1) Dioxin-like PCB and dioxin congeners are not shown on this table because we do not evaluate non-carcinogenic risk of these compounds.
(2) M indicates the Medium EPC was used while R indicates the Route EPC was used.
(3) All reference doses are chronic values.
(4) The "Total Hazard Index Across All Exposure Routes/Pathways" is the HI for the following exposure pathways: surface water ingestion and dermal contact, sediment ingestion and dermal contact, and fish ingestion.

TABLE 7.10.CT
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Kelley Brook and adjacent wetlands
Receptor Population: Fisherperson
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (2)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (3)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient (4)
Sediment Ingestion	Methyl-tert-butyl ether	1.70E-02	mg/kg	1.70E-02	mg/kg	M	7.32E-10	mg/kg/day	NA	mg/kg-day	NA	NA	---
	C11-C22 Aromatics	1.10E+03	mg/kg	1.10E+03	mg/kg	M	4.74E-05	mg/kg/day	3.00E-02	mg/kg-day	NA	NA	2.E-03
	Benz(a)anthracene	5.00E-02	mg/kg	5.00E-02	mg/kg	M	2.15E-09	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(a)pyrene	5.30E-02	mg/kg	5.30E-02	mg/kg	M	2.28E-09	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(b)fluoranthene	5.80E-02	mg/kg	5.80E-02	mg/kg	M	2.50E-09	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(k)fluoranthene	5.10E-02	mg/kg	5.10E-02	mg/kg	M	2.20E-09	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Chrysene	7.30E-02	mg/kg	7.30E-02	mg/kg	M	3.14E-09	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Dibenz(ah)anthracene	1.80E-02	mg/kg	1.80E-02	mg/kg	M	7.75E-10	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Indeno(123-cd)pyrene	3.60E-02	mg/kg	3.60E-02	mg/kg	M	1.55E-09	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Polychlorinated Biphenyls	7.70E-01	mg/kg	7.70E-01	mg/kg	M	3.32E-08	mg/kg/day	2.00E-05	mg/kg-day	NA	NA	2.E-03
	Arsenic	5.80E+01	mg/kg	5.80E+01	mg/kg	M	2.50E-06	mg/kg/day	3.00E-04	mg/kg-day	NA	NA	8.E-03
	Beryllium	1.50E+00	mg/kg	1.50E+00	mg/kg	M	6.46E-08	mg/kg/day	2.00E-03	mg/kg-day	NA	NA	3.E-05
	Chromium VI (particulates)	2.90E+01	mg/kg	2.90E+01	mg/kg	M	1.25E-06	mg/kg/day	3.00E-03	mg/kg-day	NA	NA	4.E-04
	Manganese	1.50E+03	mg/kg	1.50E+03	mg/kg	M	6.46E-05	mg/kg/day	7.00E-02	mg/kg-day	NA	NA	9.E-04
	Mercury	4.20E-01	mg/kg	4.20E-01	mg/kg	M	1.81E-08	mg/kg/day	1.00E-04	mg/kg-day	NA	NA	2.E-04
	Thallium	2.50E-01	mg/kg	2.50E-01	mg/kg	M	1.08E-08	mg/kg/day	8.00E-05	mg/kg-day	NA	NA	1.E-04
	(Total)												1.E-02
Sediment Dermal	Methyl-tert-butyl ether	1.70E-02	mg/kg	1.70E-02	mg/kg	M	4.45E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	C11-C22 Aromatics	1.10E+03	mg/kg	1.10E+03	mg/kg	M	5.18E-04	mg/kg/day	3.00E-02	mg/kg-day	NA	NA	2.E-02
	Benz(a)anthracene	5.00E-02	mg/kg	5.00E-02	mg/kg	M	1.70E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(a)pyrene	5.30E-02	mg/kg	5.30E-02	mg/kg	M	1.80E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(b)fluoranthene	5.80E-02	mg/kg	5.80E-02	mg/kg	M	1.97E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(k)fluoranthene	5.10E-02	mg/kg	5.10E-02	mg/kg	M	1.73E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Chrysene	7.30E-02	mg/kg	7.30E-02	mg/kg	M	2.48E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Dibenz(ah)anthracene	1.80E-02	mg/kg	1.80E-02	mg/kg	M	6.12E-09	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Indeno(123-cd)pyrene	3.60E-02	mg/kg	3.60E-02	mg/kg	M	1.22E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Polychlorinated Biphenyls	7.70E-01	mg/kg	7.70E-01	mg/kg	M	2.82E-07	mg/kg/day	2.00E-05	mg/kg-day	NA	NA	1.E-02
	Arsenic	5.80E+01	mg/kg	5.80E+01	mg/kg	M	4.55E-06	mg/kg/day	2.85E-04	mg/kg-day	NA	NA	2.E-02
	Beryllium	1.50E+00	mg/kg	1.50E+00	mg/kg	M	3.92E-08	mg/kg/day	2.00E-05	mg/kg-day	NA	NA	2.E-03
	Chromium VI (particulates)	2.90E+01	mg/kg	2.90E+01	mg/kg	M	7.58E-07	mg/kg/day	3.00E-05	mg/kg-day	NA	NA	3.E-02
	Manganese	1.50E+03	mg/kg	1.50E+03	mg/kg	M	3.92E-05	mg/kg/day	3.50E-03	mg/kg-day	NA	NA	1.E-02
	Mercury	4.20E-01	mg/kg	4.20E-01	mg/kg	M	1.10E-08	mg/kg/day	7.00E-06	mg/kg-day	NA	NA	2.E-03
	Thallium	2.50E-01	mg/kg	2.50E-01	mg/kg	M	6.54E-09	mg/kg/day	8.00E-05	mg/kg-day	NA	NA	8.E-05
	(Total)												9.E-02
												Total Hazard Index Across All Routes/Pathways	4.E-01

(1) Dioxin-like PCB and dioxin congeners are not shown on this table because we do not evaluate non-carcinogenic risk of these compounds.
(2) M indicates the Medium EPC was used while R indicates the Route EPC was used.
(3) All reference doses are chronic values.
(4) The "Total Hazard Index Across All Exposure Routes/Pathways" is the HI for the following exposure pathways: surface water ingestion and dermal contact, sediment ingestion and dermal contact, and fish ingestion.

TABLE 7.11.RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current/Future
Medium: Other (Fish Tissue)
Exposure Medium: Animal Tissue
Exposure Point: Brook Trout
Receptor Population: Fisherperson
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (2)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (3)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient (4)
Food Ingestion	Aldrin	6.20E-05	mg/kg	6.20E-05	mg/kg	M	1.06E-08	mg/kg/day	3.00E-05	mg/kg-day	NA	NA	4.E-04
	4,4'-DDE	5.90E-03	mg/kg	5.90E-03	mg/kg	M	1.01E-06	mg/kg/day	5.00E-04	mg/kg-day	NA	NA	2.E-03
	4,4'-DDT	1.10E-02	mg/kg	1.10E-02	mg/kg	M	1.89E-06	mg/kg/day	5.00E-04	mg/kg-day	NA	NA	4.E-03
	Dieldrin	5.90E-04	mg/kg	5.90E-04	mg/kg	M	1.01E-07	mg/kg/day	5.00E-05	mg/kg-day	NA	NA	2.E-03
	Heptachlor Epoxide	1.60E-04	mg/kg	1.60E-04	mg/kg	M	2.74E-08	mg/kg/day	1.30E-05	mg/kg-day	NA	NA	2.E-03
	cis-nonachlor	1.30E-03	mg/kg	1.30E-03	mg/kg	M	2.23E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	trans-nonachlor	1.20E-03	mg/kg	1.20E-03	mg/kg	M	2.06E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Polychlorinated Biphenyls	2.80E-01	mg/kg	2.80E-01	mg/kg	M	4.80E-05	mg/kg/day	2.00E-05	mg/kg-day	NA	NA	2.E+00
	Arsenic	3.60E-01	mg/kg	3.60E-01	mg/kg	M	6.17E-05	mg/kg/day	3.00E-04	mg/kg-day	NA	NA	2.E-01
	Chromium VI (particulates)	3.30E-01	mg/kg	3.30E-01	mg/kg	M	5.66E-05	mg/kg/day	3.00E-03	mg/kg-day	NA	NA	2.E-02
	Copper	1.30E+02	mg/kg	1.30E+02	mg/kg	M	2.23E-02	mg/kg/day	4.00E-02	mg/kg-day	NA	NA	6.E-01
	Lead	6.20E+00	mg/kg	6.20E+00	mg/kg	M	1.06E-03	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Manganese	8.00E+00	mg/kg	8.00E+00	mg/kg	M	1.37E-03	mg/kg/day	1.40E-01	mg/kg-day	NA	NA	1.E-02
	Mercury	1.80E-01	mg/kg	1.80E-01	mg/kg	M	3.09E-05	mg/kg/day	1.00E-04	mg/kg-day	NA	NA	3.E-01
	Zinc	9.80E+01	mg/kg	9.80E+01	mg/kg	M	1.68E-02	mg/kg/day	3.00E-01	mg/kg-day	NA	NA	6.E-02
	(Total)												4.E+00
												Total Hazard Index Across All Routes/Pathways	5.E+00

(1) Dioxin-like PCB and dioxin congeners are not shown on this table because we do not evaluate non-carcinogenic risk of these compounds.
(2) M indicates the Medium EPC was used while R indicates the Route EPC was used.
(3) All reference doses are chronic values.
(4) The "Total Hazard Index Across All Exposure Routes/Pathways" is the HI for the following exposure pathways: surface water ingestion and dermal contact, sediment ingestion and dermal contact, and fish ingestion.

TABLE 7.11.CT
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current/Future
Medium: Other (Fish Tissue)
Exposure Medium: Animal Tissue
Exposure Point: Brook Trout
Receptor Population: Fisherperson
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (2)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (3)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient (4)
Food Ingestion	Aldrin	3.10E-05	mg/kg	3.10E-05	mg/kg	M	1.64E-09	mg/kg/day	3.00E-05	mg/kg-day	NA	NA	5.E-05
	4,4'-DDE	5.90E-03	mg/kg	5.90E-03	mg/kg	M	3.12E-07	mg/kg/day	5.00E-04	mg/kg-day	NA	NA	6.E-04
	4,4'-DDT	1.40E-03	mg/kg	1.40E-03	mg/kg	M	7.40E-08	mg/kg/day	5.00E-04	mg/kg-day	NA	NA	1.E-04
	Dieldrin	5.90E-04	mg/kg	5.90E-04	mg/kg	M	3.12E-08	mg/kg/day	5.00E-05	mg/kg-day	NA	NA	6.E-04
	Heptachlor Epoxide	1.60E-04	mg/kg	1.60E-04	mg/kg	M	8.46E-09	mg/kg/day	1.30E-05	mg/kg-day	NA	NA	7.E-04
	cis-nonachlor	3.30E-04	mg/kg	3.30E-04	mg/kg	M	1.74E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	trans-nonachlor	1.20E-03	mg/kg	1.20E-03	mg/kg	M	6.34E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Polychlorinated Biphenyls	5.10E-02	mg/kg	5.10E-02	mg/kg	M	2.70E-06	mg/kg/day	2.00E-05	mg/kg-day	NA	NA	1.E-01
	Arsenic	8.80E-02	mg/kg	8.80E-02	mg/kg	M	4.65E-06	mg/kg/day	3.00E-04	mg/kg-day	NA	NA	2.E-02
	Chromium VI (particulates)	3.30E-01	mg/kg	3.30E-01	mg/kg	M	1.74E-05	mg/kg/day	3.00E-03	mg/kg-day	NA	NA	6.E-03
	Copper	6.90E+00	mg/kg	6.90E+00	mg/kg	M	3.65E-04	mg/kg/day	4.00E-02	mg/kg-day	NA	NA	9.E-03
	Lead	4.00E-01	mg/kg	4.00E-01	mg/kg	M	2.11E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Manganese	8.00E+00	mg/kg	8.00E+00	mg/kg	M	4.23E-04	mg/kg/day	1.40E-01	mg/kg-day	NA	NA	3.E-03
	Mercury	1.80E-01	mg/kg	1.80E-01	mg/kg	M	9.51E-06	mg/kg/day	1.00E-04	mg/kg-day	NA	NA	1.E-01
	Zinc	1.90E+01	mg/kg	1.90E+01	mg/kg	M	1.00E-03	mg/kg/day	3.00E-01	mg/kg-day	NA	NA	3.E-03
	(Total)												3.E-01
												Total Hazard Index Across All Routes/Pathways	4.E-01

(1) Dioxin-like PCB and dioxin congeners are not shown on this table because we do not evaluate non-carcinogenic risk of these compounds.
(2) M indicates the Medium EPC was used while R indicates the Route EPC was used.
(3) All reference doses are chronic values.
(4) The "Total Hazard Index Across All Exposure Routes/Pathways" is the HI for the following exposure pathways: surface water ingestion and dermal contact, sediment ingestion and dermal contact, and fish ingestion.

TABLE 7.12.RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Kelley Brook and adjacent wetlands
Receptor Population: Other Recreational Person
Receptor Age: Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient (3)
Surface Water Ingestion	1,2-Dichloroethene (cis)	1.10E-02	mg/L	1.10E-02	mg/L	M	3.68E-06	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	4.E-04
	Vinyl Chloride	3.00E-03	mg/L	3.00E-03	mg/L	M	1.00E-06	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	2.E-04
	Benz(a)anthracene	3.90E-04	mg/L	3.90E-04	mg/L	M	1.31E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(a)pyrene	4.40E-04	mg/L	4.40E-04	mg/L	M	1.47E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(b)fluoranthene	4.10E-04	mg/L	4.10E-04	mg/L	M	1.37E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(k)fluoranthene	3.50E-04	mg/L	3.50E-04	mg/L	M	1.17E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Chrysene	4.20E-04	mg/L	4.20E-04	mg/L	M	1.41E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Dibenz(ah)anthracene	6.10E-05	mg/L	6.10E-05	mg/L	M	2.04E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Indeno(123-cd)pyrene	4.20E-04	mg/L	4.20E-04	mg/L	M	1.41E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Heptachlor Epoxide	1.70E-06	mg/L	1.70E-06	mg/L	M	5.69E-10	mg/kg/day	1.30E-05	mg/kg-day	NA	NA	4.E-05
	Arsenic	3.80E-03	mg/L	3.80E-03	mg/L	M	1.27E-06	mg/kg/day	3.00E-04	mg/kg-day	NA	NA	4.E-03
	Manganese	1.20E+00	mg/L	1.20E+00	mg/L	M	4.02E-04	mg/kg/day	2.40E-02	mg/kg-day	NA	NA	2.E-02
	Molybdenum	4.90E-02	mg/L	4.90E-02	mg/L	M	1.64E-05	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	3.E-03
	(Total)												2.E-02
Surface Water Dermal	1,2-Dichloroethene (cis)	1.10E-02	mg/L	1.10E-02	mg/L	M	1.79E-05	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	2.E-03
	Vinyl Chloride	3.00E-03	mg/L	3.00E-03	mg/L	M	3.57E-06	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	7.E-04
	Benz(a)anthracene	3.90E-04	mg/L	3.90E-04	mg/L	M	5.14E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(a)pyrene	4.40E-04	mg/L	4.40E-04	mg/L	M	8.60E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(b)fluoranthene	4.10E-04	mg/L	4.10E-04	mg/L	M	8.01E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(k)fluoranthene	3.50E-04	mg/L	3.50E-04	mg/L	M	6.84E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Chrysene	4.20E-04	mg/L	4.20E-04	mg/L	M	5.54E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Dibenz(ah)anthracene	6.10E-05	mg/L	6.10E-05	mg/L	M	2.68E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Indeno(123-cd)pyrene	4.20E-04	mg/L	4.20E-04	mg/L	M	1.30E-04	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Heptachlor Epoxide	1.70E-06	mg/L	1.70E-06	mg/L	M	3.04E-09	mg/kg/day	1.30E-05	mg/kg-day	NA	NA	2.E-04
	Arsenic	3.80E-03	mg/L	3.80E-03	mg/L	M	6.19E-07	mg/kg/day	2.85E-04	mg/kg-day	NA	NA	2.E-03
	Manganese	1.20E+00	mg/L	1.20E+00	mg/L	M	1.95E-04	mg/kg/day	1.20E-03	mg/kg-day	NA	NA	2.E-01
	Molybdenum	4.90E-02	mg/L	4.90E-02	mg/L	M	7.98E-06	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	2.E-03
	(Total)												2.E-01
												Total Hazard Index Across All Routes/Pathways	4.E+00

(1) M indicates the Medium EPC was used while R indicates the Route EPC was used.
(2) All reference doses are chronic values.
(3) The "Total Hazard Index Across All Exposure Routes/Pathways" is the HI for exposure to surface water and sediment via ingestion and dermal contact.

TABLE 7.12.CT
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Kelley Brook and adjacent wetlands
Receptor Population: Other Recreational Person
Receptor Age: Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient (3)
Surface Water Ingestion	1,2-Dichloroethene (cis)	2.80E-03	mg/L	2.80E-03	mg/L	M	3.75E-07	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	4.E-05
	Vinyl Chloride	1.30E-03	mg/L	1.30E-03	mg/L	M	1.74E-07	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	3.E-05
	Benz(a)anthracene	6.00E-05	mg/L	6.00E-05	mg/L	M	8.04E-09	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(a)pyrene	6.70E-05	mg/L	6.70E-05	mg/L	M	8.97E-09	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(b)fluoranthene	6.30E-05	mg/L	6.30E-05	mg/L	M	8.44E-09	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(k)fluoranthene	5.50E-05	mg/L	5.50E-05	mg/L	M	7.37E-09	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Chrysene	6.50E-05	mg/L	6.50E-05	mg/L	M	8.71E-09	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Dibenz(ah)anthracene	1.20E-05	mg/L	1.20E-05	mg/L	M	1.61E-09	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Indeno(123-cd)pyrene	6.50E-05	mg/L	6.50E-05	mg/L	M	8.71E-09	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Heptachlor Epoxide	9.60E-07	mg/L	9.60E-07	mg/L	M	1.29E-10	mg/kg/day	1.30E-05	mg/kg-day	NA	NA	1.E-05
	Arsenic	1.80E-03	mg/L	1.80E-03	mg/L	M	2.41E-07	mg/kg/day	3.00E-04	mg/kg-day	NA	NA	8.E-04
	Manganese	7.20E-01	mg/L	7.20E-01	mg/L	M	9.64E-05	mg/kg/day	2.40E-02	mg/kg-day	NA	NA	4.E-03
	Molybdenum	2.10E-02	mg/L	2.10E-02	mg/L	M	2.81E-06	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	6.E-04
	(Total)												5.E-03
Surface Water Dermal	1,2-Dichloroethene (cis)	2.80E-03	mg/L	2.80E-03	mg/L	M	1.82E-06	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	2.E-04
	Vinyl Chloride	1.30E-03	mg/L	1.30E-03	mg/L	M	6.18E-07	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	1.E-04
	Benz(a)anthracene	6.00E-05	mg/L	6.00E-05	mg/L	M	3.17E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(a)pyrene	6.70E-05	mg/L	6.70E-05	mg/L	M	5.24E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(b)fluoranthene	6.30E-05	mg/L	6.30E-05	mg/L	M	4.92E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(k)fluoranthene	5.50E-05	mg/L	5.50E-05	mg/L	M	4.30E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Chrysene	6.50E-05	mg/L	6.50E-05	mg/L	M	3.43E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Dibenz(ah)anthracene	1.20E-05	mg/L	1.20E-05	mg/L	M	2.11E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Indeno(123-cd)pyrene	6.50E-05	mg/L	6.50E-05	mg/L	M	8.04E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Heptachlor Epoxide	9.60E-07	mg/L	9.60E-07	mg/L	M	6.88E-10	mg/kg/day	1.30E-05	mg/kg-day	NA	NA	5.E-05
	Arsenic	1.80E-03	mg/L	1.80E-03	mg/L	M	1.17E-07	mg/kg/day	2.85E-04	mg/kg-day	NA	NA	4.E-04
	Manganese	7.20E-01	mg/L	7.20E-01	mg/L	M	4.69E-05	mg/kg/day	1.20E-03	mg/kg-day	NA	NA	4.E-02
	Molybdenum	2.10E-02	mg/L	2.10E-02	mg/L	M	1.37E-06	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	3.E-04
	(Total)												4.E-02
												Total Hazard Index Across All Routes/Pathways	6.E-01

(1) M indicates the Medium EPC was used while R indicates the Route EPC was used.
(2) All reference doses are chronic values.
(3) The "Total Hazard Index Across All Exposure Routes/Pathways" is the HI for exposure to surface water and sediment via ingestion and dermal contact.

TABLE 7.13.RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Kelley Brook and adjacent wetlands
Receptor Population: Other Recreational Person
Receptor Age: Child

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (2)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (3)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient (4)
Sediment Ingestion	Methyl-tert-butyl ether	7.50E-02	mg/kg	7.50E-02	mg/kg	M	5.02E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	C11-C22 Aromatics	1.10E+03	mg/kg	1.10E+03	mg/kg	M	7.37E-04	mg/kg/day	3.00E-02	mg/kg-day	NA	NA	2.E-02
	Benz(a)anthracene	1.10E-01	mg/kg	1.10E-01	mg/kg	M	7.37E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(a)pyrene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	8.71E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(b)fluoranthene	1.60E-01	mg/kg	1.60E-01	mg/kg	M	1.07E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(k)fluoranthene	1.50E-01	mg/kg	1.50E-01	mg/kg	M	1.00E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Chrysene	1.50E-01	mg/kg	1.50E-01	mg/kg	M	1.00E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Dibenz(ah)anthracene	3.00E-02	mg/kg	3.00E-02	mg/kg	M	2.01E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Indeno(123-cd)pyrene	8.60E-02	mg/kg	8.60E-02	mg/kg	M	5.76E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Polychlorinated Biphenyls	3.50E+00	mg/kg	3.50E+00	mg/kg	M	2.34E-06	mg/kg/day	2.00E-05	mg/kg-day	NA	NA	1.E-01
	Arsenic	5.80E+01	mg/kg	5.80E+01	mg/kg	M	3.88E-05	mg/kg/day	3.00E-04	mg/kg-day	NA	NA	1.E-01
	Beryllium	1.50E+00	mg/kg	1.50E+00	mg/kg	M	1.00E-06	mg/kg/day	2.00E-03	mg/kg-day	NA	NA	5.E-04
	Chromium VI (particulates)	2.90E+01	mg/kg	2.90E+01	mg/kg	M	1.94E-05	mg/kg/day	3.00E-03	mg/kg-day	NA	NA	6.E-03
	Manganese	1.20E+04	mg/kg	1.20E+04	mg/kg	M	8.04E-03	mg/kg/day	7.00E-02	mg/kg-day	NA	NA	1.E-01
	Mercury	4.20E-01	mg/kg	4.20E-01	mg/kg	M	2.81E-07	mg/kg/day	1.00E-04	mg/kg-day	NA	NA	3.E-03
	Thallium	6.90E-01	mg/kg	6.90E-01	mg/kg	M	4.62E-07	mg/kg/day	8.00E-05	mg/kg-day	NA	NA	6.E-03
	(Total)												4.E-01
Sediment Dermal	Methyl-tert-butyl ether	7.50E-02	mg/kg	7.50E-02	mg/kg	M	2.57E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	C11-C22 Aromatics	1.10E+03	mg/kg	1.10E+03	mg/kg	M	6.79E-03	mg/kg/day	3.00E-02	mg/kg-day	NA	NA	2.E-01
	Benz(a)anthracene	1.10E-01	mg/kg	1.10E-01	mg/kg	M	4.91E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(a)pyrene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	5.80E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(b)fluoranthene	1.60E-01	mg/kg	1.60E-01	mg/kg	M	7.14E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(k)fluoranthene	1.50E-01	mg/kg	1.50E-01	mg/kg	M	6.69E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Chrysene	1.50E-01	mg/kg	1.50E-01	mg/kg	M	6.69E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Dibenz(ah)anthracene	3.00E-02	mg/kg	3.00E-02	mg/kg	M	1.34E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Indeno(123-cd)pyrene	8.60E-02	mg/kg	8.60E-02	mg/kg	M	3.84E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Polychlorinated Biphenyls	3.50E+00	mg/kg	3.50E+00	mg/kg	M	1.68E-05	mg/kg/day	2.00E-05	mg/kg-day	NA	NA	8.E-01
	Arsenic	5.80E+01	mg/kg	5.80E+01	mg/kg	M	5.97E-05	mg/kg/day	2.85E-04	mg/kg-day	NA	NA	2.E-01
	Beryllium	1.50E+00	mg/kg	1.50E+00	mg/kg	M	5.15E-07	mg/kg/day	2.00E-05	mg/kg-day	NA	NA	3.E-02
	Chromium VI (particulates)	2.90E+01	mg/kg	2.90E+01	mg/kg	M	9.95E-06	mg/kg/day	3.00E-05	mg/kg-day	NA	NA	3.E-01
	Manganese	1.20E+04	mg/kg	1.20E+04	mg/kg	M	4.12E-03	mg/kg/day	3.50E-03	mg/kg-day	NA	NA	1.E+00
	Mercury	4.20E-01	mg/kg	4.20E-01	mg/kg	M	1.44E-07	mg/kg/day	7.00E-06	mg/kg-day	NA	NA	2.E-02
	Thallium	6.90E-01	mg/kg	6.90E-01	mg/kg	M	2.37E-07	mg/kg/day	8.00E-05	mg/kg-day	NA	NA	3.E-03
	(Total)												3.E+00
												Total Hazard Index Across All Routes/Pathways	4.E+00

(1) Dioxin-like PCB and dioxin congeners are not shown on this table because we do not evaluate non-carcinogenic risk of these compounds.
(2) M indicates the Medium EPC was used while R indicates the Route EPC was used.
(3) All reference doses are chronic values.
(4) The "Total Hazard Index Across All Exposure Routes/Pathways" is the HI for exposure to surface water and sediment via ingestion and dermal contact.

TABLE 7.13.CT
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Kelley Brook and adjacent wetlands
Receptor Population: Other Recreational Person
Receptor Age: Child

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (2)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (3)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient (4)
Sediment Ingestion	Methyl-tert-butyl ether	1.70E-02	mg/kg	1.70E-02	mg/kg	M	2.28E-09	mg/kg/day	NA	mg/kg-day	NA	NA	---
	C11-C22 Aromatics	1.10E+03	mg/kg	1.10E+03	mg/kg	M	1.47E-04	mg/kg/day	3.00E-02	mg/kg-day	NA	NA	5.E-03
	Benz(a)anthracene	5.00E-02	mg/kg	5.00E-02	mg/kg	M	6.70E-09	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(a)pyrene	5.30E-02	mg/kg	5.30E-02	mg/kg	M	7.10E-09	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(b)fluoranthene	5.80E-02	mg/kg	5.80E-02	mg/kg	M	7.77E-09	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(k)fluoranthene	5.10E-02	mg/kg	5.10E-02	mg/kg	M	6.83E-09	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Chrysene	7.30E-02	mg/kg	7.30E-02	mg/kg	M	9.78E-09	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Dibenz(ah)anthracene	1.80E-02	mg/kg	1.80E-02	mg/kg	M	2.41E-09	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Indeno(123-cd)pyrene	3.60E-02	mg/kg	3.60E-02	mg/kg	M	4.82E-09	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Polychlorinated Biphenyls	7.70E-01	mg/kg	7.70E-01	mg/kg	M	1.03E-07	mg/kg/day	2.00E-05	mg/kg-day	NA	NA	5.E-03
	Arsenic	5.80E+01	mg/kg	5.80E+01	mg/kg	M	7.77E-06	mg/kg/day	3.00E-04	mg/kg-day	NA	NA	3.E-02
	Beryllium	1.50E+00	mg/kg	1.50E+00	mg/kg	M	2.01E-07	mg/kg/day	2.00E-03	mg/kg-day	NA	NA	1.E-04
	Chromium VI (particulates)	2.90E+01	mg/kg	2.90E+01	mg/kg	M	3.88E-06	mg/kg/day	3.00E-03	mg/kg-day	NA	NA	1.E-03
	Manganese	1.50E+03	mg/kg	1.50E+03	mg/kg	M	2.01E-04	mg/kg/day	7.00E-02	mg/kg-day	NA	NA	3.E-03
	Mercury	4.20E-01	mg/kg	4.20E-01	mg/kg	M	5.63E-08	mg/kg/day	1.00E-04	mg/kg-day	NA	NA	6.E-04
	Thallium	2.50E-01	mg/kg	2.50E-01	mg/kg	M	3.35E-08	mg/kg/day	8.00E-05	mg/kg-day	NA	NA	4.E-04
	(Total)												4.E-02
Sediment Dermal	Methyl-tert-butyl ether	1.70E-02	mg/kg	1.70E-02	mg/kg	M	2.33E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	C11-C22 Aromatics	1.10E+03	mg/kg	1.10E+03	mg/kg	M	2.72E-03	mg/kg/day	3.00E-02	mg/kg-day	NA	NA	9.E-02
	Benz(a)anthracene	5.00E-02	mg/kg	5.00E-02	mg/kg	M	8.92E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(a)pyrene	5.30E-02	mg/kg	5.30E-02	mg/kg	M	9.46E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(b)fluoranthene	5.80E-02	mg/kg	5.80E-02	mg/kg	M	1.03E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(k)fluoranthene	5.10E-02	mg/kg	5.10E-02	mg/kg	M	9.10E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Chrysene	7.30E-02	mg/kg	7.30E-02	mg/kg	M	1.30E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Dibenz(ah)anthracene	1.80E-02	mg/kg	1.80E-02	mg/kg	M	3.21E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Indeno(123-cd)pyrene	3.60E-02	mg/kg	3.60E-02	mg/kg	M	6.42E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Polychlorinated Biphenyls	7.70E-01	mg/kg	7.70E-01	mg/kg	M	1.48E-06	mg/kg/day	2.00E-05	mg/kg-day	NA	NA	7.E-02
	Arsenic	5.80E+01	mg/kg	5.80E+01	mg/kg	M	2.39E-05	mg/kg/day	2.85E-04	mg/kg-day	NA	NA	8.E-02
	Beryllium	1.50E+00	mg/kg	1.50E+00	mg/kg	M	2.06E-07	mg/kg/day	2.00E-05	mg/kg-day	NA	NA	1.E-02
	Chromium VI (particulates)	2.90E+01	mg/kg	2.90E+01	mg/kg	M	3.98E-06	mg/kg/day	3.00E-05	mg/kg-day	NA	NA	1.E-01
	Manganese	1.50E+03	mg/kg	1.50E+03	mg/kg	M	2.06E-04	mg/kg/day	3.50E-03	mg/kg-day	NA	NA	6.E-02
	Mercury	4.20E-01	mg/kg	4.20E-01	mg/kg	M	5.76E-08	mg/kg/day	7.00E-06	mg/kg-day	NA	NA	8.E-03
	Thallium	2.50E-01	mg/kg	2.50E-01	mg/kg	M	3.43E-08	mg/kg/day	8.00E-05	mg/kg-day	NA	NA	4.E-04
	(Total)												5.E-01
												Total Hazard Index Across All Routes/Pathways	6.E-01

(1) Dioxin-like PCB and dioxin congeners are not shown on this table because we do not evaluate non-carcinogenic risk of these compounds.
(2) M indicates the Medium EPC was used while R indicates the Route EPC was used.
(3) All reference doses are chronic values.
(4) The "Total Hazard Index Across All Exposure Routes/Pathways" is the HI for exposure to surface water and sediment via ingestion and dermal contact.

TABLE 7.14.RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: 0 to 1 foot soil
Receptor Population: Trespasser
Receptor Age: Child

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (2)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (3)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient (4)
Soil Ingestion	1,2-Dichloroethene (cis)	4.00E-03	mg/kg	4.00E-03	mg/kg	M	2.68E-09	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	3.E-07
	para-Isopropyltoluene	8.40E-03	mg/kg	8.40E-03	mg/kg	M	5.63E-09	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Tetrachloroethene	2.30E+00	mg/kg	2.30E+00	mg/kg	M	1.54E-06	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	2.E-04
	1,2,4-Trimethylbenzene	4.80E+00	mg/kg	4.80E+00	mg/kg	M	3.21E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,3,5-Trimethylbenzene	5.30E+00	mg/kg	5.30E+00	mg/kg	M	3.55E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	C9-C18 Aliphatics	4.60E+03	mg/kg	4.60E+03	mg/kg	M	3.08E-03	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	3.E-02
	C11-C22 Aromatics	8.20E+03	mg/kg	8.20E+03	mg/kg	M	5.49E-03	mg/kg/day	3.00E-02	mg/kg-day	NA	NA	2.E-01
	Naphthalene	5.90E-01	mg/kg	5.90E-01	mg/kg	M	3.95E-07	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	2.E-05
	Benz(a)anthracene	3.70E+00	mg/kg	3.70E+00	mg/kg	M	2.48E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(a)pyrene	2.00E+00	mg/kg	2.00E+00	mg/kg	M	1.34E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(b)fluoranthene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	8.04E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(k)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	1.14E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Chrysene	2.10E+00	mg/kg	2.10E+00	mg/kg	M	1.41E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Dibenz(ah)anthracene	2.80E-01	mg/kg	2.80E-01	mg/kg	M	1.88E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Indeno(123-cd)pyrene	6.60E-01	mg/kg	6.60E-01	mg/kg	M	4.42E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	bis(2-Ethylhexyl)phthalate	1.30E+02	mg/kg	1.30E+02	mg/kg	M	8.71E-05	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	4.E-03
	Polychlorinated Biphenyls	3.80E+02	mg/kg	3.80E+02	mg/kg	M	2.54E-04	mg/kg/day	2.00E-05	mg/kg-day	NA	NA	1.E+01
	Antimony	6.20E-01	mg/kg	6.20E-01	mg/kg	M	4.15E-07	mg/kg/day	4.00E-04	mg/kg-day	NA	NA	1.E-03
	Arsenic	7.00E+00	mg/kg	7.00E+00	mg/kg	M	4.69E-06	mg/kg/day	3.00E-04	mg/kg-day	NA	NA	2.E-02
	Barium	3.20E+03	mg/kg	3.20E+03	mg/kg	M	2.14E-03	mg/kg/day	7.00E-02	mg/kg-day	NA	NA	3.E-02
	Beryllium	3.60E-01	mg/kg	3.60E-01	mg/kg	M	2.41E-07	mg/kg/day	2.00E-03	mg/kg-day	NA	NA	1.E-04
	Cadmium (Food)	2.30E+01	mg/kg	2.30E+01	mg/kg	M	1.54E-05	mg/kg/day	1.00E-03	mg/kg-day	NA	NA	2.E-02
	Chromium VI (particulates)	5.30E+02	mg/kg	5.30E+02	mg/kg	M	3.55E-04	mg/kg/day	3.00E-03	mg/kg-day	NA	NA	1.E-01
	Copper	2.10E+01	mg/kg	2.10E+01	mg/kg	M	1.41E-05	mg/kg/day	4.00E-02	mg/kg-day	NA	NA	4.E-04
	Lead	9.00E+02	mg/kg	9.00E+02	mg/kg	M	6.03E-04	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Manganese	2.60E+02	mg/kg	2.60E+02	mg/kg	M	1.74E-04	mg/kg/day	7.00E-02	mg/kg-day	NA	NA	2.E-03
	Mercury	3.00E-01	mg/kg	3.00E-01	mg/kg	M	2.01E-07	mg/kg/day	1.00E-04	mg/kg-day	NA	NA	2.E-03
	Molybdenum	3.60E+00	mg/kg	3.60E+00	mg/kg	M	2.41E-06	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	5.E-04
	Nickel	9.20E+02	mg/kg	9.20E+02	mg/kg	M	6.16E-04	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	3.E-02
	Vanadium	1.60E+01	mg/kg	1.60E+01	mg/kg	M	1.07E-05	mg/kg/day	7.00E-03	mg/kg-day	NA	NA	2.E-03
	Zinc	1.60E+03	mg/kg	1.60E+03	mg/kg	M	1.07E-03	mg/kg/day	3.00E-01	mg/kg-day	NA	NA	4.E-03
	(Total)												1.E+01
												Total Hazard Index Across Direct Expsoure Routes/Pathways	2.E+01
												Total Hazard Index Across All Expsoure Routes/Pathways	2.E+01

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (2)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (3)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient (4)
Soil	1,2-Dichloroethene (cis)	4.00E-03	mg/kg	4.00E-03	mg/kg	M	0.00E+00	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	---
Dermal	para-Isopropyltoluene	8.40E-03	mg/kg	8.40E-03	mg/kg	M	1.38E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Tetrachloroethene	2.30E+00	mg/kg	2.30E+00	mg/kg	M	0.00E+00	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	---
	1,2,4-Trimethylbenzene	4.80E+00	mg/kg	4.80E+00	mg/kg	M	7.88E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,3,5-Trimethylbenzene	5.30E+00	mg/kg	5.30E+00	mg/kg	M	8.70E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	C9-C18 Aliphatics	4.60E+03	mg/kg	4.60E+03	mg/kg	M	1.51E-03	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	2.E-02
	C11-C22 Aromatics	8.20E+03	mg/kg	8.20E+03	mg/kg	M	2.42E-03	mg/kg/day	3.00E-02	mg/kg-day	NA	NA	8.E-02
	Naphthalene	5.90E-01	mg/kg	5.90E-01	mg/kg	M	9.68E-07	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	5.E-05
	Benz(a)anthracene	3.70E+00	mg/kg	3.70E+00	mg/kg	M	7.89E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(a)pyrene	2.00E+00	mg/kg	2.00E+00	mg/kg	M	4.27E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(b)fluoranthene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	2.56E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(k)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	3.63E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Chrysene	2.10E+00	mg/kg	2.10E+00	mg/kg	M	4.48E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Dibenz(ah)anthracene	2.80E-01	mg/kg	2.80E-01	mg/kg	M	5.97E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Indeno(123-cd)pyrene	6.60E-01	mg/kg	6.60E-01	mg/kg	M	1.41E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	bis(2-Ethylhexyl)phthalate	1.30E+02	mg/kg	1.30E+02	mg/kg	M	2.77E-05	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	1.E-03
	Polychlorinated Biphenyls	3.80E+02	mg/kg	3.80E+02	mg/kg	M	8.73E-05	mg/kg/day	2.00E-05	mg/kg-day	NA	NA	4.E+00
	Antimony	6.20E-01	mg/kg	6.20E-01	mg/kg	M	1.02E-08	mg/kg/day	4.00E-05	mg/kg-day	NA	NA	3.E-04
	Arsenic	7.00E+00	mg/kg	7.00E+00	mg/kg	M	3.45E-07	mg/kg/day	2.85E-04	mg/kg-day	NA	NA	1.E-03
	Barium	3.20E+03	mg/kg	3.20E+03	mg/kg	M	5.25E-05	mg/kg/day	3.50E-03	mg/kg-day	NA	NA	2.E-02
	Beryllium	3.60E-01	mg/kg	3.60E-01	mg/kg	M	5.91E-09	mg/kg/day	2.00E-05	mg/kg-day	NA	NA	3.E-04
	Cadmium (Food)	2.30E+01	mg/kg	2.30E+01	mg/kg	M	3.77E-07	mg/kg/day	2.50E-05	mg/kg-day	NA	NA	2.E-02
	Chromium VI (particulates)	5.30E+02	mg/kg	5.30E+02	mg/kg	M	8.70E-06	mg/kg/day	3.00E-05	mg/kg-day	NA	NA	3.E-01
	Copper	2.10E+01	mg/kg	2.10E+01	mg/kg	M	3.45E-07	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	2.E-05
	Lead	9.00E+02	mg/kg	9.00E+02	mg/kg	M	1.48E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Manganese	2.60E+02	mg/kg	2.60E+02	mg/kg	M	4.27E-06	mg/kg/day	3.50E-03	mg/kg-day	NA	NA	1.E-03
	Mercury	3.00E-01	mg/kg	3.00E-01	mg/kg	M	4.92E-09	mg/kg/day	7.00E-06	mg/kg-day	NA	NA	7.E-04
	Molybdenum	3.60E+00	mg/kg	3.60E+00	mg/kg	M	5.91E-08	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	1.E-05
	Nickel	9.20E+02	mg/kg	9.20E+02	mg/kg	M	1.51E-05	mg/kg/day	2.00E-04	mg/kg-day	NA	NA	8.E-02
	Vanadium	1.60E+01	mg/kg	1.60E+01	mg/kg	M	2.63E-07	mg/kg/day	1.40E-04	mg/kg-day	NA	NA	2.E-03
	Zinc	1.60E+03	mg/kg	1.60E+03	mg/kg	M	2.63E-05	mg/kg/day	7.50E-02	mg/kg-day	NA	NA	4.E-04
	(Total)												5.E+00
												Total Hazard Index Across Direct Expsoure Routes/Pathways	2.E+01
												Total Hazard Index Across All Expsoure Routes/Pathways	2.E+01

(1) Dioxin-like PCB and dioxin congeners are not shown on this table because we do not evaluate non-carcinogenic risk of these compounds.
(2) M indicates the Medium EPC was used while R indicates the Route EPC was used.
(3) All reference doses are chronic values.
(4) The "Total Hazard Index Across Direct Exposure Routes/Pathways" is the HI for the soil ingestion and soil dermal contact exposure pathways.
The "Total Hazard Index Across All Exposure Routes/Pathways" is the HI for the direct exposure pathways, plus the HI for soil dust and vapor inhalation pathways.

TABLE 7.14.CT
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: 0 to 1 foot soil
Receptor Population: Trespasser
Receptor Age: Child

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (2)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (3)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient (4)
Soil Ingestion	1,2-Dichloroethene (cis)	4.00E-03	mg/kg	4.00E-03	mg/kg	M	5.36E-10	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	5.E-08
	para-Isopropyltoluene	8.40E-03	mg/kg	8.40E-03	mg/kg	M	1.13E-09	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Tetrachloroethene	1.60E-01	mg/kg	1.60E-01	mg/kg	M	2.14E-08	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	2.E-06
	1,2,4-Trimethylbenzene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	2.95E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,3,5-Trimethylbenzene	2.40E-01	mg/kg	2.40E-01	mg/kg	M	3.21E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	C9-C18 Aliphatics	4.80E+02	mg/kg	4.80E+02	mg/kg	M	6.43E-05	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	6.E-04
	C11-C22 Aromatics	8.80E+02	mg/kg	8.80E+02	mg/kg	M	1.18E-04	mg/kg/day	3.00E-02	mg/kg-day	NA	NA	4.E-03
	Naphthalene	7.10E-02	mg/kg	7.10E-02	mg/kg	M	9.51E-09	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	5.E-07
	Benz(a)anthracene	3.70E+00	mg/kg	3.70E+00	mg/kg	M	4.96E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(a)pyrene	4.70E-01	mg/kg	4.70E-01	mg/kg	M	6.30E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(b)fluoranthene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	1.61E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(k)fluoranthene	4.30E-01	mg/kg	4.30E-01	mg/kg	M	5.76E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Chrysene	2.10E+00	mg/kg	2.10E+00	mg/kg	M	2.81E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Dibenz(ah)anthracene	2.80E-01	mg/kg	2.80E-01	mg/kg	M	3.75E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Indeno(123-cd)pyrene	6.60E-01	mg/kg	6.60E-01	mg/kg	M	8.84E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	bis(2-Ethylhexyl)phthalate	2.30E+01	mg/kg	2.30E+01	mg/kg	M	3.08E-06	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	2.E-04
	Polychlorinated Biphenyls	3.80E+02	mg/kg	3.80E+02	mg/kg	M	5.09E-05	mg/kg/day	2.00E-05	mg/kg-day	NA	NA	3.E+00
	Antimony	6.20E-01	mg/kg	6.20E-01	mg/kg	M	8.30E-08	mg/kg/day	4.00E-04	mg/kg-day	NA	NA	2.E-04
	Arsenic	7.00E+00	mg/kg	7.00E+00	mg/kg	M	9.38E-07	mg/kg/day	3.00E-04	mg/kg-day	NA	NA	3.E-03
	Barium	1.40E+02	mg/kg	1.40E+02	mg/kg	M	1.88E-05	mg/kg/day	7.00E-02	mg/kg-day	NA	NA	3.E-04
	Beryllium	3.60E-01	mg/kg	3.60E-01	mg/kg	M	4.82E-08	mg/kg/day	2.00E-03	mg/kg-day	NA	NA	2.E-05
	Cadmium (Food)	1.10E+00	mg/kg	1.10E+00	mg/kg	M	1.47E-07	mg/kg/day	1.00E-03	mg/kg-day	NA	NA	1.E-04
	Chromium VI (particulates)	3.10E+01	mg/kg	3.10E+01	mg/kg	M	4.15E-06	mg/kg/day	3.00E-03	mg/kg-day	NA	NA	1.E-03
	Copper	2.10E+01	mg/kg	2.10E+01	mg/kg	M	2.81E-06	mg/kg/day	4.00E-02	mg/kg-day	NA	NA	7.E-05
	Lead	9.00E+02	mg/kg	9.00E+02	mg/kg	M	1.21E-04	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Manganese	1.10E+02	mg/kg	1.10E+02	mg/kg	M	1.47E-05	mg/kg/day	7.00E-02	mg/kg-day	NA	NA	2.E-04
	Mercury	3.00E-01	mg/kg	3.00E-01	mg/kg	M	4.02E-08	mg/kg/day	1.00E-04	mg/kg-day	NA	NA	4.E-04
	Molybdenum	3.60E+00	mg/kg	3.60E+00	mg/kg	M	4.82E-07	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	1.E-04
	Nickel	3.80E+01	mg/kg	3.80E+01	mg/kg	M	5.09E-06	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	3.E-04
	Vanadium	1.60E+01	mg/kg	1.60E+01	mg/kg	M	2.14E-06	mg/kg/day	7.00E-03	mg/kg-day	NA	NA	3.E-04
	Zinc	1.00E+02	mg/kg	1.00E+02	mg/kg	M	1.34E-05	mg/kg/day	3.00E-01	mg/kg-day	NA	NA	4.E-05
	(Total)												3.E+00
												Total Hazard Index Across Direct Expsoure Routes/Pathways	3.E+00
												Total Hazard Index Across All Expsoure Routes/Pathways	3.E+00

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (2)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (3)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient (4)
Soil	1,2-Dichloroethene (cis)	4.00E-03	mg/kg	4.00E-03	mg/kg	M	0.00E+00	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	---
Dermal	para-Isopropyltoluene	8.40E-03	mg/kg	8.40E-03	mg/kg	M	7.88E-10	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Tetrachloroethene	1.60E-01	mg/kg	1.60E-01	mg/kg	M	0.00E+00	mg/kg/day	1.00E-02	mg/kg-day	NA	NA	---
	1,2,4-Trimethylbenzene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	2.06E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,3,5-Trimethylbenzene	2.40E-01	mg/kg	2.40E-01	mg/kg	M	2.25E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	C9-C18 Aliphatics	4.80E+02	mg/kg	4.80E+02	mg/kg	M	9.00E-06	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	9.E-05
	C11-C22 Aromatics	8.80E+02	mg/kg	8.80E+02	mg/kg	M	1.49E-05	mg/kg/day	3.00E-02	mg/kg-day	NA	NA	5.E-04
	Naphthalene	7.10E-02	mg/kg	7.10E-02	mg/kg	M	6.66E-09	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	3.E-07
	Benz(a)anthracene	3.70E+00	mg/kg	3.70E+00	mg/kg	M	4.51E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(a)pyrene	4.70E-01	mg/kg	4.70E-01	mg/kg	M	5.73E-09	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(b)fluoranthene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	1.46E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(k)fluoranthene	4.30E-01	mg/kg	4.30E-01	mg/kg	M	5.24E-09	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Chrysene	2.10E+00	mg/kg	2.10E+00	mg/kg	M	2.56E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Dibenz(ah)anthracene	2.80E-01	mg/kg	2.80E-01	mg/kg	M	3.41E-09	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Indeno(123-cd)pyrene	6.60E-01	mg/kg	6.60E-01	mg/kg	M	8.04E-09	mg/kg/day	NA	mg/kg-day	NA	NA	---
	bis(2-Ethylhexyl)phthalate	2.30E+01	mg/kg	2.30E+01	mg/kg	M	2.80E-07	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	1.E-05
	Polychlorinated Biphenyls	3.80E+02	mg/kg	3.80E+02	mg/kg	M	4.99E-06	mg/kg/day	2.00E-05	mg/kg-day	NA	NA	2.E-01
	Antimony	6.20E-01	mg/kg	6.20E-01	mg/kg	M	5.81E-10	mg/kg/day	4.00E-05	mg/kg-day	NA	NA	1.E-05
	Arsenic	7.00E+00	mg/kg	7.00E+00	mg/kg	M	1.97E-08	mg/kg/day	2.85E-04	mg/kg-day	NA	NA	7.E-05
	Barium	1.40E+02	mg/kg	1.40E+02	mg/kg	M	1.31E-07	mg/kg/day	3.50E-03	mg/kg-day	NA	NA	4.E-05
	Beryllium	3.60E-01	mg/kg	3.60E-01	mg/kg	M	3.38E-10	mg/kg/day	2.00E-05	mg/kg-day	NA	NA	2.E-05
	Cadmium (Food)	1.10E+00	mg/kg	1.10E+00	mg/kg	M	1.03E-09	mg/kg/day	2.50E-05	mg/kg-day	NA	NA	4.E-05
	Chromium VI (particulates)	3.10E+01	mg/kg	3.10E+01	mg/kg	M	2.91E-08	mg/kg/day	3.00E-05	mg/kg-day	NA	NA	1.E-03
	Copper	2.10E+01	mg/kg	2.10E+01	mg/kg	M	1.97E-08	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	1.E-06
	Lead	9.00E+02	mg/kg	9.00E+02	mg/kg	M	8.44E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Manganese	1.10E+02	mg/kg	1.10E+02	mg/kg	M	1.03E-07	mg/kg/day	3.50E-03	mg/kg-day	NA	NA	3.E-05
	Mercury	3.00E-01	mg/kg	3.00E-01	mg/kg	M	2.81E-10	mg/kg/day	7.00E-06	mg/kg-day	NA	NA	4.E-05
	Molybdenum	3.60E+00	mg/kg	3.60E+00	mg/kg	M	3.38E-09	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	7.E-07
	Nickel	3.80E+01	mg/kg	3.80E+01	mg/kg	M	3.56E-08	mg/kg/day	2.00E-04	mg/kg-day	NA	NA	2.E-04
	Vanadium	1.60E+01	mg/kg	1.60E+01	mg/kg	M	1.50E-08	mg/kg/day	1.40E-04	mg/kg-day	NA	NA	1.E-04
	Zinc	1.00E+02	mg/kg	1.00E+02	mg/kg	M	9.38E-08	mg/kg/day	7.50E-02	mg/kg-day	NA	NA	1.E-06
	(Total)												3.E-01
												Total Hazard Index Across Direct Expsoure Routes/Pathways	3.E+00
												Total Hazard Index Across All Expsoure Routes/Pathways	3.E+00

(1) Dioxin-like PCB and dioxin congeners are not shown on this table because we do not evaluate non-carcinogenic risk of these compounds.
(2) M indicates the Medium EPC was used while R indicates the Route EPC was used.
(3) All reference doses are chronic values.
(4) The "Total Hazard Index Across Direct Exposure Routes/Pathways" is the HI for the soil ingestion and soil dermal contact exposure pathways.
The "Total Hazard Index Across All Exposure Routes/Pathways" is the HI for the direct exposure pathways, plus the HI for soil dust and vapor inhalation pathways.

TABLE 7.15.RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Surface and Subsurface Soil
Exposure Point: 0 to 10 foot soil
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (2)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (3)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient (4)
Soil Ingestion	sec-Butylbenzene	1.80E-01	mg/kg	1.80E-01	mg/kg	M	5.07E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,2-Dichloroethene (cis)	1.10E+01	mg/kg	1.10E+01	mg/kg	M	3.10E-05	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	3.E-04
	para-Isopropyltoluene	1.90E-01	mg/kg	1.90E-01	mg/kg	M	5.35E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	n-Propylbenzene	2.10E-01	mg/kg	2.10E-01	mg/kg	M	5.92E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Tetrachloroethene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	3.66E-07	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	4.E-06
	1,2,4-Trimethylbenzene	2.80E+00	mg/kg	2.80E+00	mg/kg	M	7.89E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,3,5-Trimethylbenzene	7.40E-01	mg/kg	7.40E-01	mg/kg	M	2.09E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	C9-C18 Aliphatics	1.10E+03	mg/kg	1.10E+03	mg/kg	M	3.10E-03	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	3.E-02
	C11-C22 Aromatics	6.60E+02	mg/kg	6.60E+02	mg/kg	M	1.86E-03	mg/kg/day	3.00E-02	mg/kg-day	NA	NA	6.E-02
	Naphthalene	8.00E-01	mg/kg	8.00E-01	mg/kg	M	2.25E-06	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	1.E-04
	Benz(a)anthracene	8.80E-01	mg/kg	8.80E-01	mg/kg	M	2.48E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(a)pyrene	2.00E+00	mg/kg	2.00E+00	mg/kg	M	5.64E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(b)fluoranthene	5.40E-01	mg/kg	5.40E-01	mg/kg	M	1.52E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(k)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	4.79E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Chrysene	7.50E-01	mg/kg	7.50E-01	mg/kg	M	2.11E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Dibenz(ah)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	6.20E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Indeno(123-cd)pyrene	3.60E-01	mg/kg	3.60E-01	mg/kg	M	1.01E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	bis(2-Ethylhexyl)phthalate	3.40E+01	mg/kg	3.40E+01	mg/kg	M	9.58E-05	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	5.E-03
	Polychlorinated Biphenyls	9.80E+01	mg/kg	9.80E+01	mg/kg	M	2.76E-04	mg/kg/day	2.00E-05	mg/kg-day	NA	NA	1.E+01
	Antimony	7.40E-01	mg/kg	7.40E-01	mg/kg	M	2.09E-06	mg/kg/day	4.00E-04	mg/kg-day	NA	NA	5.E-03
	Arsenic	6.60E+00	mg/kg	6.60E+00	mg/kg	M	1.86E-05	mg/kg/day	3.00E-04	mg/kg-day	NA	NA	6.E-02
	Barium	7.80E+01	mg/kg	7.80E+01	mg/kg	M	2.20E-04	mg/kg/day	7.00E-02	mg/kg-day	NA	NA	3.E-03
	Beryllium	1.80E+00	mg/kg	1.80E+00	mg/kg	M	5.07E-06	mg/kg/day	2.00E-03	mg/kg-day	NA	NA	3.E-03
	Cadmium (Food)	4.40E+01	mg/kg	4.40E+01	mg/kg	M	1.24E-04	mg/kg/day	1.00E-03	mg/kg-day	NA	NA	1.E-01
	Chromium VI (particulates)	5.30E+02	mg/kg	5.30E+02	mg/kg	M	1.49E-03	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	7.E-02
	Lead	4.90E+02	mg/kg	4.90E+02	mg/kg	M	1.38E-03	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Mercury	2.40E+01	mg/kg	2.40E+01	mg/kg	M	6.76E-05	mg/kg/day	1.00E-04	mg/kg-day	NA	NA	7.E-01
	Nickel	9.20E+02	mg/kg	9.20E+02	mg/kg	M	2.59E-03	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	1.E-01
	Zinc	1.30E+02	mg/kg	1.30E+02	mg/kg	M	3.66E-04	mg/kg/day	3.00E-01	mg/kg-day	NA	NA	1.E-03
	(Total)												1.E+01
												Total Hazard Index Across Direct Exposure Routes/Pathways	5.E+01
												Total Hazard Index Across All Exposure Routes/Pathways	5.E+01

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (2)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (3)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient (4)
Soil Dermal	sec-Butylbenzene	1.80E-01	mg/kg	1.80E-01	mg/kg	M	7.72E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,2-Dichloroethene (cis)	1.10E+01	mg/kg	1.10E+01	mg/kg	M	0.00E+00	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	---
	para-Isopropyltoluene	1.90E-01	mg/kg	1.90E-01	mg/kg	M	8.15E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	n-Propylbenzene	2.10E-01	mg/kg	2.10E-01	mg/kg	M	9.00E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Tetrachloroethene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	0.00E+00	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	---
	1,2,4-Trimethylbenzene	2.80E+00	mg/kg	2.80E+00	mg/kg	M	1.20E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,3,5-Trimethylbenzene	7.40E-01	mg/kg	7.40E-01	mg/kg	M	3.17E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	C9-C18 Aliphatics	1.10E+03	mg/kg	1.10E+03	mg/kg	M	9.43E-04	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	9.E-03
	C11-C22 Aromatics	6.60E+02	mg/kg	6.60E+02	mg/kg	M	5.09E-04	mg/kg/day	3.00E-02	mg/kg-day	NA	NA	2.E-02
	Naphthalene	8.00E-01	mg/kg	8.00E-01	mg/kg	M	3.43E-06	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	2.E-04
	Benz(a)anthracene	8.80E-01	mg/kg	8.80E-01	mg/kg	M	4.90E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(a)pyrene	2.00E+00	mg/kg	2.00E+00	mg/kg	M	1.11E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(b)fluoranthene	5.40E-01	mg/kg	5.40E-01	mg/kg	M	3.01E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(k)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	9.48E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Chrysene	7.50E-01	mg/kg	7.50E-01	mg/kg	M	4.18E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Dibenz(ah)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	1.23E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Indeno(123-cd)pyrene	3.60E-01	mg/kg	3.60E-01	mg/kg	M	2.01E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	bis(2-Ethylhexyl)phthalate	3.40E+01	mg/kg	3.40E+01	mg/kg	M	1.90E-05	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	9.E-04
	Polychlorinated Biphenyls	9.80E+01	mg/kg	9.80E+01	mg/kg	M	5.88E-05	mg/kg/day	2.00E-05	mg/kg-day	NA	NA	3.E+00
	Antimony	7.40E-01	mg/kg	7.40E-01	mg/kg	M	3.17E-08	mg/kg/day	4.00E-05	mg/kg-day	NA	NA	8.E-04
	Arsenic	6.60E+00	mg/kg	6.60E+00	mg/kg	M	8.49E-07	mg/kg/day	2.85E-04	mg/kg-day	NA	NA	3.E-03
	Barium	7.80E+01	mg/kg	7.80E+01	mg/kg	M	3.34E-06	mg/kg/day	3.50E-03	mg/kg-day	NA	NA	1.E-03
	Beryllium	1.80E+00	mg/kg	1.80E+00	mg/kg	M	7.72E-08	mg/kg/day	2.00E-05	mg/kg-day	NA	NA	4.E-03
	Cadmium (Food)	4.40E+01	mg/kg	4.40E+01	mg/kg	M	1.89E-06	mg/kg/day	2.50E-05	mg/kg-day	NA	NA	8.E-02
	Chromium VI (particulates)	5.30E+02	mg/kg	5.30E+02	mg/kg	M	2.27E-05	mg/kg/day	2.00E-04	mg/kg-day	NA	NA	1.E-01
	Lead	4.90E+02	mg/kg	4.90E+02	mg/kg	M	2.10E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Mercury	2.40E+01	mg/kg	2.40E+01	mg/kg	M	1.03E-06	mg/kg/day	7.00E-06	mg/kg-day	NA	NA	1.E-01
	Nickel	9.20E+02	mg/kg	9.20E+02	mg/kg	M	3.94E-05	mg/kg/day	2.00E-04	mg/kg-day	NA	NA	2.E-01
	Zinc	1.30E+02	mg/kg	1.30E+02	mg/kg	M	5.57E-06	mg/kg/day	7.50E-02	mg/kg-day	NA	NA	7.E-05
	(Total)												4.E+00
												Total Hazard Index Across Direct Exposure Routes/Pathways	5.E+01
												Total Hazard Index Across All Exposure Routes/Pathways	5.E+01

(1) Dioxin-like PCB and dioxin congeners are not shown on this table because we do not evaluate non-carcinogenic risk of these compounds.
(2) M indicates the Medium EPC was used while R indicates the Route EPC was used.
(3) Both subchronic and chronic reference doses are used.
(4) The "Total Hazard Index Across Direct Exposure Routes/Pathways" is the HI for the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.
The "Total Hazard Index Across All Exposure Routes/Pathways" is the HI for the direct exposure pathways, plus the HI for soil dust and vapor inhalation pathways.

TABLE 7.15.CT
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Surface and Subsurface Soil
Exposure Point: 0 to 10 foot soil
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (2)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (3)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient (4)
Soil Ingestion	sec-Butylbenzene	1.80E-01	mg/kg	1.80E-01	mg/kg	M	3.04E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,2-Dichloroethene (cis)	1.80E-01	mg/kg	1.80E-01	mg/kg	M	3.04E-07	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	3.E-06
	para-Isopropyltoluene	1.90E-01	mg/kg	1.90E-01	mg/kg	M	3.21E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	n-Propylbenzene	2.10E-01	mg/kg	2.10E-01	mg/kg	M	3.55E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Tetrachloroethene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	2.20E-07	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	2.E-06
	1,2,4-Trimethylbenzene	2.80E+00	mg/kg	2.80E+00	mg/kg	M	4.73E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,3,5-Trimethylbenzene	7.40E-01	mg/kg	7.40E-01	mg/kg	M	1.25E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	C9-C18 Aliphatics	1.10E+03	mg/kg	1.10E+03	mg/kg	M	1.86E-03	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	2.E-02
	C11-C22 Aromatics	6.60E+02	mg/kg	6.60E+02	mg/kg	M	1.12E-03	mg/kg/day	3.00E-02	mg/kg-day	NA	NA	4.E-02
	Naphthalene	8.00E-01	mg/kg	8.00E-01	mg/kg	M	1.35E-06	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	7.E-05
	Benz(a)anthracene	8.80E-01	mg/kg	8.80E-01	mg/kg	M	1.49E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(a)pyrene	3.70E-01	mg/kg	3.70E-01	mg/kg	M	6.26E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(b)fluoranthene	5.40E-01	mg/kg	5.40E-01	mg/kg	M	9.13E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(k)fluoranthene	3.30E-01	mg/kg	3.30E-01	mg/kg	M	5.58E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Chrysene	7.50E-01	mg/kg	7.50E-01	mg/kg	M	1.27E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Dibenz(ah)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	3.72E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Indeno(123-cd)pyrene	3.60E-01	mg/kg	3.60E-01	mg/kg	M	6.09E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	bis(2-Ethylhexyl)phthalate	3.40E+01	mg/kg	3.40E+01	mg/kg	M	5.75E-05	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	3.E-03
	Polychlorinated Biphenyls	9.80E+01	mg/kg	9.80E+01	mg/kg	M	1.66E-04	mg/kg/day	2.00E-05	mg/kg-day	NA	NA	8.E+00
	Antimony	7.40E-01	mg/kg	7.40E-01	mg/kg	M	1.25E-06	mg/kg/day	4.00E-04	mg/kg-day	NA	NA	3.E-03
	Arsenic	6.60E+00	mg/kg	6.60E+00	mg/kg	M	1.12E-05	mg/kg/day	3.00E-04	mg/kg-day	NA	NA	4.E-02
	Barium	7.80E+01	mg/kg	7.80E+01	mg/kg	M	1.32E-04	mg/kg/day	7.00E-02	mg/kg-day	NA	NA	2.E-03
	Beryllium	4.00E-01	mg/kg	4.00E-01	mg/kg	M	6.76E-07	mg/kg/day	2.00E-03	mg/kg-day	NA	NA	3.E-04
	Cadmium (Food)	1.30E+00	mg/kg	1.30E+00	mg/kg	M	2.20E-06	mg/kg/day	1.00E-03	mg/kg-day	NA	NA	2.E-03
	Chromium VI (particulates)	2.60E+01	mg/kg	2.60E+01	mg/kg	M	4.40E-05	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	2.E-03
	Lead	4.90E+02	mg/kg	4.90E+02	mg/kg	M	8.28E-04	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Mercury	6.10E+00	mg/kg	6.10E+00	mg/kg	M	1.03E-05	mg/kg/day	1.00E-04	mg/kg-day	NA	NA	1.E-01
	Nickel	2.30E+01	mg/kg	2.30E+01	mg/kg	M	3.89E-05	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	2.E-03
	Zinc	1.30E+02	mg/kg	1.30E+02	mg/kg	M	2.20E-04	mg/kg/day	3.00E-01	mg/kg-day	NA	NA	7.E-04
	(Total)												8.E+00
												Total Hazard Index Across Direct Exposure Routes/Pathways	1.E+01
												Total Hazard Index Across All Exposure Routes/Pathways	1.E+01

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (2)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (3)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient (4)
Soil	sec-Butylbenzene	1.80E-01	mg/kg	1.80E-01	mg/kg	M	4.63E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
Dermal	1,2-Dichloroethene (cis)	1.80E-01	mg/kg	1.80E-01	mg/kg	M	0.00E+00	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	---
	para-Isopropyltoluene	1.90E-01	mg/kg	1.90E-01	mg/kg	M	4.89E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	n-Propylbenzene	2.10E-01	mg/kg	2.10E-01	mg/kg	M	5.40E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Tetrachloroethene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	0.00E+00	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	---
	1,2,4-Trimethylbenzene	2.80E+00	mg/kg	2.80E+00	mg/kg	M	7.20E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,3,5-Trimethylbenzene	7.40E-01	mg/kg	7.40E-01	mg/kg	M	1.90E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	C9-C18 Aliphatics	1.10E+03	mg/kg	1.10E+03	mg/kg	M	5.66E-04	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	6.E-03
	C11-C22 Aromatics	6.60E+02	mg/kg	6.60E+02	mg/kg	M	3.06E-04	mg/kg/day	3.00E-02	mg/kg-day	NA	NA	1.E-02
	Naphthalene	8.00E-01	mg/kg	8.00E-01	mg/kg	M	2.06E-06	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	1.E-04
	Benz(a)anthracene	8.80E-01	mg/kg	8.80E-01	mg/kg	M	2.94E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(a)pyrene	3.70E-01	mg/kg	3.70E-01	mg/kg	M	1.24E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(b)fluoranthene	5.40E-01	mg/kg	5.40E-01	mg/kg	M	1.81E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Benzo(k)fluoranthene	3.30E-01	mg/kg	3.30E-01	mg/kg	M	1.10E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Chrysene	7.50E-01	mg/kg	7.50E-01	mg/kg	M	2.51E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Dibenz(ah)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	7.36E-08	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Indeno(123-cd)pyrene	3.60E-01	mg/kg	3.60E-01	mg/kg	M	1.20E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	bis(2-Ethylhexyl)phthalate	3.40E+01	mg/kg	3.40E+01	mg/kg	M	1.14E-05	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	6.E-04
	Polychlorinated Biphenyls	9.80E+01	mg/kg	9.80E+01	mg/kg	M	3.53E-05	mg/kg/day	2.00E-05	mg/kg-day	NA	NA	2.E+00
	Antimony	7.40E-01	mg/kg	7.40E-01	mg/kg	M	1.90E-08	mg/kg/day	4.00E-05	mg/kg-day	NA	NA	5.E-04
	Arsenic	6.60E+00	mg/kg	6.60E+00	mg/kg	M	5.09E-07	mg/kg/day	2.85E-04	mg/kg-day	NA	NA	2.E-03
	Barium	7.80E+01	mg/kg	7.80E+01	mg/kg	M	2.01E-06	mg/kg/day	3.50E-03	mg/kg-day	NA	NA	6.E-04
	Beryllium	4.00E-01	mg/kg	4.00E-01	mg/kg	M	1.03E-08	mg/kg/day	2.00E-05	mg/kg-day	NA	NA	5.E-04
	Cadmium (Food)	1.30E+00	mg/kg	1.30E+00	mg/kg	M	3.34E-08	mg/kg/day	2.50E-05	mg/kg-day	NA	NA	1.E-03
	Chromium VI (particulates)	2.60E+01	mg/kg	2.60E+01	mg/kg	M	6.69E-07	mg/kg/day	2.00E-04	mg/kg-day	NA	NA	3.E-03
	Lead	4.90E+02	mg/kg	4.90E+02	mg/kg	M	1.26E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Mercury	6.10E+00	mg/kg	6.10E+00	mg/kg	M	1.57E-07	mg/kg/day	7.00E-06	mg/kg-day	NA	NA	2.E-02
	Nickel	2.30E+01	mg/kg	2.30E+01	mg/kg	M	5.92E-07	mg/kg/day	2.00E-04	mg/kg-day	NA	NA	3.E-03
	Zinc	1.30E+02	mg/kg	1.30E+02	mg/kg	M	3.34E-06	mg/kg/day	7.50E-02	mg/kg-day	NA	NA	4.E-05
	(Total)												2.E+00
												Total Hazard Index Across Direct Exposure Routes/Pathways	1.E+01
												Total Hazard Index Across All Exposure Routes/Pathways	1.E+01

(1) Dioxin-like PCB and dioxin congeners are not shown on this table because we do not evaluate non-carcinogenic risk of these compounds.
(2) M indicates the Medium EPC was used while R indicates the Route EPC was used.
(3) Both subchronic and chronic reference doses are used.
(4) The "Total Hazard Index Across Direct Exposure Routes/Pathways" is the HI for the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.
The "Total Hazard Index Across All Exposure Routes/Pathways" is the HI for the direct exposure pathways, plus the HI for soil dust and vapor inhalation pathways.

TABLE 7.16.RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Excavation Site
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient (3)
Ground Water Ingestion	Benzene	2.40E-01	mg/L	2.40E-01	mg/L	M	7.05E-05	mg/kg/day	1.00E-03	mg/kg-day	NA	NA	7.E-02
	sec-Butylbenzene	1.50E-02	mg/L	1.50E-02	mg/L	M	4.40E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Chloroethane	7.10E-02	mg/L	7.10E-02	mg/L	M	2.08E-05	mg/kg/day	4.00E-01	mg/kg-day	NA	NA	2.E-06
	1,1-Dichloroethane	3.10E-01	mg/L	3.10E-01	mg/L	M	9.10E-05	mg/kg/day	1.00E+00	mg/kg-day	NA	NA	9.E-05
	1,1-Dichloroethene	8.00E-03	mg/L	8.00E-03	mg/L	M	2.35E-06	mg/kg/day	9.00E-03	mg/kg-day	NA	NA	3.E-04
	1,2-Dichloroethene (cis)	2.50E+00	mg/L	2.50E+00	mg/L	M	7.34E-04	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	7.E-03
	1,2-Dichloroethene (trans)	1.00E-01	mg/L	1.00E-01	mg/L	M	2.94E-05	mg/kg/day	2.00E-01	mg/kg-day	NA	NA	1.E-04
	Ethylbenzene	9.40E-01	mg/L	9.40E-01	mg/L	M	2.76E-04	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	3.E-03
	para-Isopropyltoluene	1.50E-02	mg/L	1.50E-02	mg/L	M	4.40E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	n-Propylbenzene	4.30E-02	mg/L	4.30E-02	mg/L	M	1.26E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,1,2,2-Tetrachloroethane	1.90E-03	mg/L	1.90E-03	mg/L	M	5.58E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Tetrachloroethene	2.50E-02	mg/L	2.50E-02	mg/L	M	7.34E-06	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	7.E-05
	Toluene	4.80E-01	mg/L	4.80E-01	mg/L	M	1.41E-04	mg/kg/day	2.00E+00	mg/kg-day	NA	NA	7.E-05
	1,1,1-Trichloroethane	6.30E-01	mg/L	6.30E-01	mg/L	M	1.85E-04	mg/kg/day	2.00E-01	mg/kg-day	NA	NA	9.E-04
	Trichloroethene	1.30E-02	mg/L	1.30E-02	mg/L	M	3.82E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,2,4-Trimethylbenzene	4.60E-01	mg/L	4.60E-01	mg/L	M	1.35E-04	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,3,5-Trimethylbenzene	2.00E-01	mg/L	2.00E-01	mg/L	M	5.87E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Vinyl Chloride	7.30E-01	mg/L	7.30E-01	mg/L	M	2.14E-04	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	4.E-02
	Naphthalene	1.70E-01	mg/L	1.70E-01	mg/L	M	4.99E-05	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	2.E-03
	1,2-Dichlorobenzene	2.20E-02	mg/L	2.20E-02	mg/L	M	6.46E-06	mg/kg/day	9.00E-02	mg/kg-day	NA	NA	7.E-05
	Arsenic	2.80E-02	mg/L	2.80E-02	mg/L	M	8.22E-06	mg/kg/day	3.00E-04	mg/kg-day	NA	NA	3.E-02
	Manganese	4.10E+00	mg/L	4.10E+00	mg/L	M	1.20E-03	mg/kg/day	2.40E-02	mg/kg-day	NA	NA	5.E-02
	Nitrate	3.60E-01	mg/L	3.60E-01	mg/L	M	1.06E-04	mg/kg/day	1.60E+00	mg/kg-day	NA	NA	7.E-05
	(Total)												2.E-01
												Total Hazard Index Across Direct Exposure Routes/Pathways	5.E+01
												Total Hazard Index Across All Exposure Routes/Pathways	5.E+01

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient (3)
Ground Water Dermal	Benzene	2.40E-01	mg/L	2.40E-01	mg/L	M	1.97E-02	mg/kg/day	1.00E-03	mg/kg-day	NA	NA	2.E+01
	sec-Butylbenzene	1.50E-02	mg/L	1.50E-02	mg/L	M	1.23E-03	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Chloroethane	7.10E-02	mg/L	7.10E-02	mg/L	M	4.24E-04	mg/kg/day	4.00E-01	mg/kg-day	NA	NA	1.E-03
	1,1-Dichloroethane	3.10E-01	mg/L	3.10E-01	mg/L	M	2.06E-03	mg/kg/day	1.00E+00	mg/kg-day	NA	NA	2.E-03
	1,1-Dichloroethene	8.00E-03	mg/L	8.00E-03	mg/L	M	9.56E-05	mg/kg/day	9.00E-03	mg/kg-day	NA	NA	1.E-02
	1,2-Dichloroethene (cis)	2.50E+00	mg/L	2.50E+00	mg/L	M	1.87E-02	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	2.E-01
	1,2-Dichloroethene (trans)	1.00E-01	mg/L	1.00E-01	mg/L	M	7.47E-04	mg/kg/day	2.00E-01	mg/kg-day	NA	NA	4.E-03
	Ethylbenzene	9.40E-01	mg/L	9.40E-01	mg/L	M	7.02E-01	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	8.E+00
	para-Isopropyltoluene	1.50E-02	mg/L	1.50E-02	mg/L	M	1.23E-03	mg/kg/day	NA	mg/kg-day	NA	NA	---
	n-Propylbenzene	4.30E-02	mg/L	4.30E-02	mg/L	M	3.53E-03	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,1,2,2-Tetrachloroethane	1.90E-03	mg/L	1.90E-03	mg/L	M	1.28E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Tetrachloroethene	2.50E-02	mg/L	2.50E-02	mg/L	M	6.91E-03	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	7.E-02
	Toluene	4.80E-01	mg/L	4.80E-01	mg/L	M	3.59E-01	mg/kg/day	2.00E+00	mg/kg-day	NA	NA	2.E-01
	1,1,1-Trichloroethane	6.30E-01	mg/L	6.30E-01	mg/L	M	8.00E-03	mg/kg/day	2.00E-01	mg/kg-day	NA	NA	4.E-02
	Trichloroethene	1.30E-02	mg/L	1.30E-02	mg/L	M	2.23E-03	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,2,4-Trimethylbenzene	4.60E-01	mg/L	4.60E-01	mg/L	M	3.78E-02	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,3,5-Trimethylbenzene	2.00E-01	mg/L	2.00E-01	mg/L	M	1.64E-02	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Vinyl Chloride	7.30E-01	mg/L	7.30E-01	mg/L	M	3.98E-03	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	8.E-01
	Naphthalene	1.70E-01	mg/L	1.70E-01	mg/L	M	8.77E-03	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	4.E-01
	1,2-Dichlorobenzene	2.20E-02	mg/L	2.20E-02	mg/L	M	1.00E-03	mg/kg/day	9.00E-02	mg/kg-day	NA	NA	1.E-02
	Arsenic	2.80E-02	mg/L	2.80E-02	mg/L	M	2.09E-05	mg/kg/day	2.85E-04	mg/kg-day	NA	NA	7.E-02
	Manganese	4.10E+00	mg/L	4.10E+00	mg/L	M	3.06E-03	mg/kg/day	1.20E-03	mg/kg-day	NA	NA	3.E+00
	Nitrate	3.60E-01	mg/L	3.60E-01	mg/L	M	2.69E-04	mg/kg/day	1.60E+00	mg/kg-day	NA	NA	2.E-04
	(Total)												3.E+01
												Total Hazard Index Across Direct Exposure Routes/Pathways	5.E+01
												Total Hazard Index Across All Exposure Routes/Pathways	5.E+01

(1) M indicates the Medium EPC was used while R indicates the Route EPC was used.
(2) Both subchronic and chronic reference doses are used.
(3) The "Total Hazard Index Across Direct Exposure Routes/Pathways" is the HI for the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.
The "Total Hazard Index Across All Exposure Routes/Pathways" is the HI for the direct exposure pathways, plus the HI for soil dust and vapor inhalation pathways.

TABLE 7.16.CT
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Excavation Site
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient (3)
Ground Water Ingestion	Benzene	2.90E-02	mg/L	2.90E-02	mg/L	M	5.11E-06	mg/kg/day	1.00E-03	mg/kg-day	NA	NA	5.E-03
	sec-Butylbenzene	3.30E-03	mg/L	3.30E-03	mg/L	M	5.81E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Chloroethane	9.00E-03	mg/L	9.00E-03	mg/L	M	1.59E-06	mg/kg/day	4.00E-01	mg/kg-day	NA	NA	2.E-07
	1,1-Dichloroethane	3.80E-02	mg/L	3.80E-02	mg/L	M	6.69E-06	mg/kg/day	1.00E+00	mg/kg-day	NA	NA	7.E-06
	1,1-Dichloroethene	2.20E-03	mg/L	2.20E-03	mg/L	M	3.87E-07	mg/kg/day	9.00E-03	mg/kg-day	NA	NA	4.E-05
	1,2-Dichloroethene (cis)	3.10E-01	mg/L	3.10E-01	mg/L	M	5.46E-05	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	5.E-04
	1,2-Dichloroethene (trans)	1.50E-02	mg/L	1.50E-02	mg/L	M	2.64E-06	mg/kg/day	2.00E-01	mg/kg-day	NA	NA	1.E-05
	Ethylbenzene	1.10E-01	mg/L	1.10E-01	mg/L	M	1.94E-05	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	2.E-04
	para-Isopropyltoluene	3.50E-03	mg/L	3.50E-03	mg/L	M	6.16E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	n-Propylbenzene	8.20E-03	mg/L	8.20E-03	mg/L	M	1.44E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,1,2,2-Tetrachloroethane	1.90E-03	mg/L	1.90E-03	mg/L	M	3.35E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Tetrachloroethene	3.90E-03	mg/L	3.90E-03	mg/L	M	6.87E-07	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	7.E-06
	Toluene	4.70E-02	mg/L	4.70E-02	mg/L	M	8.28E-06	mg/kg/day	2.00E+00	mg/kg-day	NA	NA	4.E-06
	1,1,1-Trichloroethane	8.90E-02	mg/L	8.90E-02	mg/L	M	1.57E-05	mg/kg/day	2.00E-01	mg/kg-day	NA	NA	8.E-05
	Trichloroethene	3.00E-03	mg/L	3.00E-03	mg/L	M	5.28E-07	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,2,4-Trimethylbenzene	8.10E-02	mg/L	8.10E-02	mg/L	M	1.43E-05	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,3,5-Trimethylbenzene	3.90E-02	mg/L	3.90E-02	mg/L	M	6.87E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Vinyl Chloride	7.60E-02	mg/L	7.60E-02	mg/L	M	1.34E-05	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	3.E-03
	Naphthalene	3.40E-02	mg/L	3.40E-02	mg/L	M	5.99E-06	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	3.E-04
	1,2-Dichlorobenzene	3.70E-03	mg/L	3.70E-03	mg/L	M	6.52E-07	mg/kg/day	9.00E-02	mg/kg-day	NA	NA	7.E-06
	Arsenic	1.10E-02	mg/L	1.10E-02	mg/L	M	1.94E-06	mg/kg/day	3.00E-04	mg/kg-day	NA	NA	6.E-03
	Manganese	3.70E+00	mg/L	3.70E+00	mg/L	M	6.52E-04	mg/kg/day	2.40E-02	mg/kg-day	NA	NA	3.E-02
	Nitrate	1.20E-01	mg/L	1.20E-01	mg/L	M	2.11E-05	mg/kg/day	1.60E+00	mg/kg-day	NA	NA	1.E-05
	(Total)												4.E-02
												Total Hazard Index Across Direct Exposure Routes/Pathways	1.E+01
												Total Hazard Index Across All Exposure Routes/Pathways	1.E+01

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient (3)
Ground	Benzene	2.90E-02	mg/L	2.90E-02	mg/L	M	9.38E-04	mg/kg/day	1.00E-03	mg/kg-day	NA	NA	9.E-01
Water	sec-Butylbenzene	3.30E-03	mg/L	3.30E-03	mg/L	M	1.07E-04	mg/kg/day	NA	mg/kg-day	NA	NA	---
Dermal	Chloroethane	9.00E-03	mg/L	9.00E-03	mg/L	M	2.12E-05	mg/kg/day	4.00E-01	mg/kg-day	NA	NA	5.E-05
	1,1-Dichloroethane	3.80E-02	mg/L	3.80E-02	mg/L	M	9.94E-05	mg/kg/day	1.00E+00	mg/kg-day	NA	NA	1.E-04
	1,1-Dichloroethene	2.20E-03	mg/L	2.20E-03	mg/L	M	1.03E-05	mg/kg/day	9.00E-03	mg/kg-day	NA	NA	1.E-03
	1,2-Dichloroethene (cis)	3.10E-01	mg/L	3.10E-01	mg/L	M	9.11E-04	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	9.E-03
	1,2-Dichloroethene (trans)	1.50E-02	mg/L	1.50E-02	mg/L	M	4.41E-05	mg/kg/day	2.00E-01	mg/kg-day	NA	NA	2.E-04
	Ethylbenzene	1.10E-01	mg/L	1.10E-01	mg/L	M	3.23E-02	mg/kg/day	9.20E-02	mg/kg-day	NA	NA	4.E-01
	para-Isopropyltoluene	3.50E-03	mg/L	3.50E-03	mg/L	M	1.13E-04	mg/kg/day	NA	mg/kg-day	NA	NA	---
	n-Propylbenzene	8.20E-03	mg/L	8.20E-03	mg/L	M	2.65E-04	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,1,2,2-Tetrachloroethane	1.90E-03	mg/L	1.90E-03	mg/L	M	5.03E-06	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Tetrachloroethene	3.90E-03	mg/L	3.90E-03	mg/L	M	4.24E-04	mg/kg/day	1.00E-01	mg/kg-day	NA	NA	4.E-03
	Toluene	4.70E-02	mg/L	4.70E-02	mg/L	M	1.38E-02	mg/kg/day	2.00E+00	mg/kg-day	NA	NA	7.E-03
	1,1,1-Trichloroethane	8.90E-02	mg/L	8.90E-02	mg/L	M	4.45E-04	mg/kg/day	2.00E-01	mg/kg-day	NA	NA	2.E-03
	Trichloroethene	3.00E-03	mg/L	3.00E-03	mg/L	M	2.03E-04	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,2,4-Trimethylbenzene	8.10E-02	mg/L	8.10E-02	mg/L	M	2.62E-03	mg/kg/day	NA	mg/kg-day	NA	NA	---
	1,3,5-Trimethylbenzene	3.90E-02	mg/L	3.90E-02	mg/L	M	1.26E-03	mg/kg/day	NA	mg/kg-day	NA	NA	---
	Vinyl Chloride	7.60E-02	mg/L	7.60E-02	mg/L	M	1.63E-04	mg/kg/day	5.00E-03	mg/kg-day	NA	NA	3.E-02
	Naphthalene	3.40E-02	mg/L	3.40E-02	mg/L	M	6.90E-04	mg/kg/day	2.00E-02	mg/kg-day	NA	NA	3.E-02
	1,2-Dichlorobenzene	3.70E-03	mg/L	3.70E-03	mg/L	M	6.64E-05	mg/kg/day	9.00E-02	mg/kg-day	NA	NA	7.E-04
	Arsenic	1.10E-02	mg/L	1.10E-02	mg/L	M	3.23E-06	mg/kg/day	2.85E-04	mg/kg-day	NA	NA	1.E-02
	Manganese	3.70E+00	mg/L	3.70E+00	mg/L	M	1.09E-03	mg/kg/day	1.20E-03	mg/kg-day	NA	NA	9.E-01
	Nitrate	1.20E-01	mg/L	1.20E-01	mg/L	M	3.53E-05	mg/kg/day	1.60E+00	mg/kg-day	NA	NA	2.E-05
	(Total)												2.E+00
												Total Hazard Index Across Direct Exposure Routes/Pathways	1.E+01
												Total Hazard Index Across All Exposure Routes/Pathways	1.E+01

(1) M indicates the Medium EPC was used while R indicates the Route EPC was used.
(2) Both subchronic and chronic reference doses are used.
(3) The "Total Hazard Index Across Direct Exposure Routes/Pathways" is the HI for the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.
The "Total Hazard Index Across All Exposure Routes/Pathways" is the HI for the direct exposure pathways, plus the HI for soil dust and vapor inhalation pathways.

APPENDIX O

RAGS PART D TABLE 8 SERIES:

CALCULATION OF CANCER RISKS

TABLE 8.1.RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Surface and Subsurface Soil
Exposure Point: 0 to 10 foot soil
Receptor Population: Resident
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (2)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (4)
Soil Ingestion	Tetrachloroethene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	2.79E-08	mg/kg-day	5.2E-02	$(mg/kg\text{-}day)^{-1}$	1.E-09
	Naphthalene	8.00E-01	mg/kg	8.00E-01	mg/kg	M	1.72E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Benz(a)anthracene	8.80E-01	mg/kg	8.80E-01	mg/kg	M	1.89E-07	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	1.E-07
	Benzo(a)pyrene	2.00E+00	mg/kg	2.00E+00	mg/kg	M	4.29E-07	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	3.E-06
	Benzo(b)fluoranthene	5.40E-01	mg/kg	5.40E-01	mg/kg	M	1.16E-07	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	8.E-08
	Benzo(k)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	3.65E-07	mg/kg-day	7.3E-02	$(mg/kg\text{-}day)^{-1}$	3.E-08
	Chrysene	7.50E-01	mg/kg	7.50E-01	mg/kg	M	1.61E-07	mg/kg-day	7.3E-03	$(mg/kg\text{-}day)^{-1}$	1.E-09
	Dibenz(ah)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	4.72E-08	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	3.E-07
	Indeno(123-cd)pyrene	3.60E-01	mg/kg	3.60E-01	mg/kg	M	7.73E-08	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	6.E-08
	bis(2-Ethylhexyl)phthalate	3.40E+01	mg/kg	3.40E+01	mg/kg	M	7.30E-06	mg/kg-day	1.4E-02	$(mg/kg\text{-}day)^{-1}$	1.E-07
	Polychlorinated Biphenyls (3)	8.00E+01	mg/kg	8.00E+01	mg/kg	M	1.72E-05	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	3.E-05
	PCB-77	3.00E+00	mg/kg	3.00E+00	mg/kg	M	6.44E-07	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	1.E-05
	PCB-81	5.30E-02	mg/kg	5.30E-02	mg/kg	M	1.14E-08	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-07
	PCB-105	2.20E+00	mg/kg	2.20E+00	mg/kg	M	4.72E-07	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	7.E-06
	PCB-114	1.40E-01	mg/kg	1.40E-01	mg/kg	M	3.01E-08	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-06
	PCB-118	3.30E+00	mg/kg	3.30E+00	mg/kg	M	7.09E-07	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	1.E-05
	PCB-123	1.80E-01	mg/kg	1.80E-01	mg/kg	M	3.86E-08	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	6.E-07
	PCB-126	7.60E-03	mg/kg	7.60E-03	mg/kg	M	1.63E-09	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	2.E-05
	PCB-156	5.00E-02	mg/kg	5.00E-02	mg/kg	M	1.07E-08	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	8.E-07
	PCB-157	1.10E-02	mg/kg	1.10E-02	mg/kg	M	2.36E-09	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-07
	PCB-167	8.70E-02	mg/kg	8.70E-02	mg/kg	M	1.87E-08	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	3.E-08
	PCB-189	3.00E-03	mg/kg	3.00E-03	mg/kg	M	6.44E-10	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	1.E-08
	2,3,7,8-TCDD	3.90E-07	mg/kg	3.90E-07	mg/kg	M	8.37E-14	mg/kg-day	1.5E+05	$(mg/kg\text{-}day)^{-1}$	1.E-08
	1,2,3,7,8-PeCDD	3.60E-06	mg/kg	3.60E-06	mg/kg	M	7.73E-13	mg/kg-day	1.5E+05	$(mg/kg\text{-}day)^{-1}$	1.E-07
	1,2,3,4,7,8-HxCDD	5.10E-06	mg/kg	5.10E-06	mg/kg	M	1.09E-12	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	2.E-08
	1,2,3,6,7,8-HxCDD	1.20E-05	mg/kg	1.20E-05	mg/kg	M	2.58E-12	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	4.E-08
	1,2,3,7,8,9-HxCDD	1.00E-05	mg/kg	1.00E-05	mg/kg	M	2.15E-12	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	3.E-08
	1,2,3,4,6,7,8-HpCDD	2.50E-04	mg/kg	2.50E-04	mg/kg	M	5.37E-11	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	8.E-08
	OCDD	2.00E-03	mg/kg	2.00E-03	mg/kg	M	4.29E-10	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	6.E-09
	2,3,7,8-TCDF	5.90E-05	mg/kg	5.90E-05	mg/kg	M	1.27E-11	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	2.E-07
	1,2,3,7,8-PeCDF	2.20E-05	mg/kg	2.20E-05	mg/kg	M	4.72E-12	mg/kg-day	7.5E+03	$(mg/kg\text{-}day)^{-1}$	4.E-08
	2,3,4,7,8-PeCDF	1.40E-04	mg/kg	1.40E-04	mg/kg	M	3.01E-11	mg/kg-day	7.5E+04	$(mg/kg\text{-}day)^{-1}$	2.E-06
	1,2,3,4,7,8-HxCDF	3.20E-05	mg/kg	3.20E-05	mg/kg	M	6.87E-12	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	1.E-07
	1,2,3,6,7,8-HxCDF	1.90E-05	mg/kg	1.90E-05	mg/kg	M	4.08E-12	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	6.E-08
	1,2,3,7,8,9-HxCDF	1.10E-05	mg/kg	1.10E-05	mg/kg	M	2.36E-12	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	4.E-08
	2,3,4,6,7,8-HxCDF	2.10E-05	mg/kg	2.10E-05	mg/kg	M	4.51E-12	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	7.E-08
	1,2,3,4,6,7,8-HpCDF	6.30E-05	mg/kg	6.30E-05	mg/kg	M	1.35E-11	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	2.E-08
	1,2,3,4,7,8,9-HpCDF	7.80E-06	mg/kg	7.80E-06	mg/kg	M	1.67E-12	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	3.E-09
	OCDF	1.00E-04	mg/kg	1.00E-04	mg/kg	M	2.15E-11	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	3.E-10
	Arsenic	6.60E+00	mg/kg	6.60E+00	mg/kg	M	1.42E-06	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	2.E-06
	Beryllium	1.80E+00	mg/kg	1.80E+00	mg/kg	M	3.86E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Cadmium (Food)	4.40E+01	mg/kg	4.40E+01	mg/kg	M	9.45E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Chromium VI (particulates)	5.30E+02	mg/kg	5.30E+02	mg/kg	M	1.14E-04	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Lead	4.90E+02	mg/kg	4.90E+02	mg/kg	M	1.05E-04	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Mercury	2.40E+01	mg/kg	2.40E+01	mg/kg	M	5.15E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	(Total)										1.E-04
										Total Risk Across Direct Exposure Routes/Pathways	2.E-02
										Total Risk Across All Exposure Routes/Pathways	4.E-02

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (2)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (4)
Soil	Tetrachloroethene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	0.00E+00	mg/kg-day	5.2E-02	(mg/kg-day)$^{-1}$	---
Dermal	Naphthalene	8.00E-01	mg/kg	8.00E-01	mg/kg	M	6.85E-07	mg/kg-day	NA	(mg/kg-day)$^{-1}$	---
	Benz(a)anthracene	8.80E-01	mg/kg	8.80E-01	mg/kg	M	9.80E-08	mg/kg-day	7.3E-01	(mg/kg-day)$^{-1}$	7.E-08
	Benzo(a)pyrene	2.00E+00	mg/kg	2.00E+00	mg/kg	M	2.23E-07	mg/kg-day	7.3E+00	(mg/kg-day)$^{-1}$	2.E-06
	Benzo(b)fluoranthene	5.40E-01	mg/kg	5.40E-01	mg/kg	M	6.01E-08	mg/kg-day	7.3E-01	(mg/kg-day)$^{-1}$	4.E-08
	Benzo(k)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	1.89E-07	mg/kg-day	7.3E-02	(mg/kg-day)$^{-1}$	1.E-08
	Chrysene	7.50E-01	mg/kg	7.50E-01	mg/kg	M	8.35E-08	mg/kg-day	7.3E-03	(mg/kg-day)$^{-1}$	6.E-10
	Dibenz(ah)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	2.45E-08	mg/kg-day	7.3E+00	(mg/kg-day)$^{-1}$	2.E-07
	Indeno(123-cd)pyrene	3.60E-01	mg/kg	3.60E-01	mg/kg	M	4.01E-08	mg/kg-day	7.3E-01	(mg/kg-day)$^{-1}$	3.E-08
	bis(2-Ethylhexyl)phthalate	3.40E+01	mg/kg	3.40E+01	mg/kg	M	3.79E-06	mg/kg-day	2.5E-02	(mg/kg-day)$^{-1}$	5.E-08
	Polychlorinated Biphenyls (3)	8.00E+01	mg/kg	8.00E+01	mg/kg	M	9.59E-06	mg/kg-day	2.0E+00	(mg/kg-day)$^{-1}$	2.E-05
	PCB-77	3.00E+00	mg/kg	3.00E+00	mg/kg	M	3.60E-07	mg/kg-day	1.5E+01	(mg/kg-day)$^{-1}$	5.E-06
	PCB-81	5.30E-02	mg/kg	5.30E-02	mg/kg	M	6.36E-09	mg/kg-day	1.5E+01	(mg/kg-day)$^{-1}$	1.E-07
	PCB-105	2.20E+00	mg/kg	2.20E+00	mg/kg	M	2.64E-07	mg/kg-day	1.5E+01	(mg/kg-day)$^{-1}$	4.E-06
	PCB-114	1.40E-01	mg/kg	1.40E-01	mg/kg	M	1.68E-08	mg/kg-day	7.5E+01	(mg/kg-day)$^{-1}$	1.E-06
	PCB-118	3.30E+00	mg/kg	3.30E+00	mg/kg	M	3.96E-07	mg/kg-day	1.5E+01	(mg/kg-day)$^{-1}$	6.E-06
	PCB-123	1.80E-01	mg/kg	1.80E-01	mg/kg	M	2.16E-08	mg/kg-day	1.5E+01	(mg/kg-day)$^{-1}$	3.E-07
	PCB-126	7.60E-03	mg/kg	7.60E-03	mg/kg	M	9.12E-10	mg/kg-day	1.5E+04	(mg/kg-day)$^{-1}$	1.E-05
	PCB-156	5.00E-02	mg/kg	5.00E-02	mg/kg	M	6.00E-09	mg/kg-day	7.5E+01	(mg/kg-day)$^{-1}$	4.E-07
	PCB-157	1.10E-02	mg/kg	1.10E-02	mg/kg	M	1.32E-09	mg/kg-day	7.5E+01	(mg/kg-day)$^{-1}$	1.E-07
	PCB-167	8.70E-02	mg/kg	8.70E-02	mg/kg	M	1.04E-08	mg/kg-day	1.5E+00	(mg/kg-day)$^{-1}$	2.E-08
	PCB-189	3.00E-03	mg/kg	3.00E-03	mg/kg	M	3.60E-10	mg/kg-day	1.5E+01	(mg/kg-day)$^{-1}$	5.E-09
	2,3,7,8-TCDD	3.90E-07	mg/kg	3.90E-07	mg/kg	M	1.00E-14	mg/kg-day	1.5E+05	(mg/kg-day)$^{-1}$	2.E-09
	1,2,3,7,8-PeCDD	3.60E-06	mg/kg	3.60E-06	mg/kg	M	9.25E-14	mg/kg-day	1.5E+05	(mg/kg-day)$^{-1}$	1.E-08
	1,2,3,4,7,8-HxCDD	5.10E-06	mg/kg	5.10E-06	mg/kg	M	1.31E-13	mg/kg-day	1.5E+04	(mg/kg-day)$^{-1}$	2.E-09
	1,2,3,6,7,8-HxCDD	1.20E-05	mg/kg	1.20E-05	mg/kg	M	3.08E-13	mg/kg-day	1.5E+04	(mg/kg-day)$^{-1}$	5.E-09
	1,2,3,7,8,9-HxCDD	1.00E-05	mg/kg	1.00E-05	mg/kg	M	2.57E-13	mg/kg-day	1.5E+04	(mg/kg-day)$^{-1}$	4.E-09
	1,2,3,4,6,7,8-HpCDD	2.50E-04	mg/kg	2.50E-04	mg/kg	M	6.43E-12	mg/kg-day	1.5E+03	(mg/kg-day)$^{-1}$	1.E-08
	OCDD	2.00E-03	mg/kg	2.00E-03	mg/kg	M	5.14E-11	mg/kg-day	1.5E+01	(mg/kg-day)$^{-1}$	8.E-10
	2,3,7,8-TCDF	5.90E-05	mg/kg	5.90E-05	mg/kg	M	1.52E-12	mg/kg-day	1.5E+04	(mg/kg-day)$^{-1}$	2.E-08
	1,2,3,7,8-PeCDF	2.20E-05	mg/kg	2.20E-05	mg/kg	M	5.65E-13	mg/kg-day	7.5E+03	(mg/kg-day)$^{-1}$	4.E-09
	2,3,4,7,8-PeCDF	1.40E-04	mg/kg	1.40E-04	mg/kg	M	3.60E-12	mg/kg-day	7.5E+04	(mg/kg-day)$^{-1}$	3.E-07
	1,2,3,4,7,8-HxCDF	3.20E-05	mg/kg	3.20E-05	mg/kg	M	8.22E-13	mg/kg-day	1.5E+04	(mg/kg-day)$^{-1}$	1.E-08
	1,2,3,6,7,8-HxCDF	1.90E-05	mg/kg	1.90E-05	mg/kg	M	4.88E-13	mg/kg-day	1.5E+04	(mg/kg-day)$^{-1}$	7.E-09
	1,2,3,7,8,9-HxCDF	1.10E-05	mg/kg	1.10E-05	mg/kg	M	2.83E-13	mg/kg-day	1.5E+04	(mg/kg-day)$^{-1}$	4.E-09
	2,3,4,6,7,8-HxCDF	2.10E-05	mg/kg	2.10E-05	mg/kg	M	5.40E-13	mg/kg-day	1.5E+04	(mg/kg-day)$^{-1}$	8.E-09
	1,2,3,4,6,7,8-HpCDF	6.30E-05	mg/kg	6.30E-05	mg/kg	M	1.62E-12	mg/kg-day	1.5E+03	(mg/kg-day)$^{-1}$	2.E-09
	1,2,3,4,7,8,9-HpCDF	7.80E-06	mg/kg	7.80E-06	mg/kg	M	2.00E-13	mg/kg-day	1.5E+03	(mg/kg-day)$^{-1}$	3.E-10
	OCDF	1.00E-04	mg/kg	1.00E-04	mg/kg	M	2.57E-12	mg/kg-day	1.5E+01	(mg/kg-day)$^{-1}$	4.E-11
	Arsenic	6.60E+00	mg/kg	6.60E+00	mg/kg	M	1.70E-07	mg/kg-day	1.6E+00	(mg/kg-day)$^{-1}$	3.E-07
	Beryllium	1.80E+00	mg/kg	1.80E+00	mg/kg	M	1.54E-08	mg/kg-day	NA	(mg/kg-day)$^{-1}$	---
	Cadmium (Food)	4.40E+01	mg/kg	4.40E+01	mg/kg	M	3.77E-07	mg/kg-day	NA	(mg/kg-day)$^{-1}$	---
	Chromium VI (particulates)	5.30E+02	mg/kg	5.30E+02	mg/kg	M	4.54E-06	mg/kg-day	NA	(mg/kg-day)$^{-1}$	---
	Lead	4.90E+02	mg/kg	4.90E+02	mg/kg	M	4.20E-06	mg/kg-day	NA	(mg/kg-day)$^{-1}$	---
	Mercury	2.40E+01	mg/kg	2.40E+01	mg/kg	M	2.06E-07	mg/kg-day	NA	(mg/kg-day)$^{-1}$	---
	(Total)										5.E-05
										Total Risk Across Direct Exposure Routes/Pathways	2.E-02
										Total Risk Across All Exposure Routes/Pathways	4.E-02

(1) COPCs shown in this table are carcinogens classifed as known (A), probable (B1, B2), possible (C), or "known/likely" under new EPA Cancer Guidelines.
(2) M indicates the Medium EPC was used while R indicates the Route EPC was used.
(3) The Polychlorinated Biphenyls (PCBs) risk is from the total PCB concentration minus the concentration of dioxin-like congeners.
(4) The "Total Risk Across Direct Exposure Routes/Pathways" is the risk from the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways. The "Total Risk Across All Exposure Routes/Pathways" is the risk from the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.

TABLE 8.1.CT
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Surface and Subsurface Soil
Exposure Point: 0 to 10 foot soil
Receptor Population: Resident
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (2)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (4)
Soil Ingestion	Tetrachloroethene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	4.07E-09	mg/kg-day	5.2E-02	$(mg/kg\text{-}day)^{-1}$	2.E-10
	Naphthalene	8.00E-01	mg/kg	8.00E-01	mg/kg	M	2.50E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Benz(a)anthracene	8.80E-01	mg/kg	8.80E-01	mg/kg	M	2.76E-08	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	2.E-08
	Benzo(a)pyrene	3.70E-01	mg/kg	3.70E-01	mg/kg	M	1.16E-08	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	8.E-08
	Benzo(b)fluoranthene	5.40E-01	mg/kg	5.40E-01	mg/kg	M	1.69E-08	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	1.E-08
	Benzo(k)fluoranthene	3.30E-01	mg/kg	3.30E-01	mg/kg	M	1.03E-08	mg/kg-day	7.3E-02	$(mg/kg\text{-}day)^{-1}$	8.E-10
	Chrysene	7.50E-01	mg/kg	7.50E-01	mg/kg	M	2.35E-08	mg/kg-day	7.3E-03	$(mg/kg\text{-}day)^{-1}$	2.E-10
	Dibenz(ah)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	6.89E-09	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	5.E-08
	Indeno(123-cd)pyrene	3.60E-01	mg/kg	3.60E-01	mg/kg	M	1.13E-08	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	8.E-09
	bis(2-Ethylhexyl)phthalate	3.40E+01	mg/kg	3.40E+01	mg/kg	M	1.06E-06	mg/kg-day	1.4E-02	$(mg/kg\text{-}day)^{-1}$	1.E-08
	Polychlorinated Biphenyls (3)	8.00E+01	mg/kg	8.00E+01	mg/kg	M	2.50E-06	mg/kg-day	1.0E+00	$(mg/kg\text{-}day)^{-1}$	3.E-06
	PCB-77	2.80E-01	mg/kg	2.80E-01	mg/kg	M	8.77E-09	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	1.E-07
	PCB-81	5.30E-02	mg/kg	5.30E-02	mg/kg	M	1.66E-09	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-08
	PCB-105	2.20E+00	mg/kg	2.20E+00	mg/kg	M	6.89E-08	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	1.E-06
	PCB-114	1.40E-01	mg/kg	1.40E-01	mg/kg	M	4.38E-09	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	3.E-07
	PCB-118	3.30E+00	mg/kg	3.30E+00	mg/kg	M	1.03E-07	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-06
	PCB-123	1.80E-01	mg/kg	1.80E-01	mg/kg	M	5.64E-09	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	8.E-08
	PCB-126	7.60E-03	mg/kg	7.60E-03	mg/kg	M	2.38E-10	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	4.E-06
	PCB-156	5.00E-02	mg/kg	5.00E-02	mg/kg	M	1.57E-09	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	1.E-07
	PCB-157	1.10E-02	mg/kg	1.10E-02	mg/kg	M	3.44E-10	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	3.E-08
	PCB-167	8.70E-02	mg/kg	8.70E-02	mg/kg	M	2.72E-09	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	4.E-09
	PCB-189	3.00E-03	mg/kg	3.00E-03	mg/kg	M	9.39E-11	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	1.E-09
	2,3,7,8-TCDD	3.00E-07	mg/kg	3.00E-07	mg/kg	M	9.39E-15	mg/kg-day	1.5E+05	$(mg/kg\text{-}day)^{-1}$	1.E-09
	1,2,3,7,8-PeCDD	1.80E-06	mg/kg	1.80E-06	mg/kg	M	5.64E-14	mg/kg-day	1.5E+05	$(mg/kg\text{-}day)^{-1}$	8.E-09
	1,2,3,4,7,8-HxCDD	2.90E-06	mg/kg	2.90E-06	mg/kg	M	9.08E-14	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	1.E-09
	1,2,3,6,7,8-HxCDD	7.70E-06	mg/kg	7.70E-06	mg/kg	M	2.41E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	4.E-09
	1,2,3,7,8,9-HxCDD	5.70E-06	mg/kg	5.70E-06	mg/kg	M	1.78E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	3.E-09
	1,2,3,4,6,7,8-HpCDD	1.30E-04	mg/kg	1.30E-04	mg/kg	M	4.07E-12	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	6.E-09
	OCDD	1.00E-03	mg/kg	1.00E-03	mg/kg	M	3.13E-11	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	5.E-10
	2,3,7,8-TCDF	2.00E-05	mg/kg	2.00E-05	mg/kg	M	6.26E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	9.E-09
	1,2,3,7,8-PeCDF	7.70E-06	mg/kg	7.70E-06	mg/kg	M	2.41E-13	mg/kg-day	7.5E+03	$(mg/kg\text{-}day)^{-1}$	2.E-09
	2,3,4,7,8-PeCDF	5.50E-05	mg/kg	5.50E-05	mg/kg	M	1.72E-12	mg/kg-day	7.5E+04	$(mg/kg\text{-}day)^{-1}$	1.E-07
	1,2,3,4,7,8-HxCDF	1.50E-05	mg/kg	1.50E-05	mg/kg	M	4.70E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	7.E-09
	1,2,3,6,7,8-HxCDF	8.80E-06	mg/kg	8.80E-06	mg/kg	M	2.76E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	4.E-09
	1,2,3,7,8,9-HxCDF	4.30E-06	mg/kg	4.30E-06	mg/kg	M	1.35E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	2.E-09
	2,3,4,6,7,8-HxCDF	1.00E-05	mg/kg	1.00E-05	mg/kg	M	3.13E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	5.E-09
	1,2,3,4,6,7,8-HpCDF	3.40E-05	mg/kg	3.40E-05	mg/kg	M	1.06E-12	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	2.E-09
	1,2,3,4,7,8,9-HpCDF	3.80E-06	mg/kg	3.80E-06	mg/kg	M	1.19E-13	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	2.E-10
	OCDF	5.20E-05	mg/kg	5.20E-05	mg/kg	M	1.63E-12	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-11
	Arsenic	6.60E+00	mg/kg	6.60E+00	mg/kg	M	2.07E-07	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	3.E-07
	Beryllium	4.00E-01	mg/kg	4.00E-01	mg/kg	M	1.25E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Cadmium (Food)	1.30E+00	mg/kg	1.30E+00	mg/kg	M	4.07E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Chromium VI (particulates)	2.60E+01	mg/kg	2.60E+01	mg/kg	M	8.14E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Lead	4.90E+02	mg/kg	4.90E+02	mg/kg	M	1.53E-05	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Mercury	6.10E+00	mg/kg	6.10E+00	mg/kg	M	1.91E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	(Total)										1.E-05
										Total Risk Across Direct Exposure Routes/Pathways	1.E-04
										Total Risk Across All Exposure Routes/Pathways	2.E-04

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (2)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (4)
Soil	Tetrachloroethene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	0.00E+00	mg/kg-day	5.2E-02	$(mg/kg\text{-}day)^{-1}$	---
Dermal	Naphthalene	8.00E-01	mg/kg	8.00E-01	mg/kg	M	2.86E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Benz(a)anthracene	8.80E-01	mg/kg	8.80E-01	mg/kg	M	4.08E-09	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	3.E-09
	Benzo(a)pyrene	3.70E-01	mg/kg	3.70E-01	mg/kg	M	1.72E-09	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	1.E-08
	Benzo(b)fluoranthene	5.40E-01	mg/kg	5.40E-01	mg/kg	M	2.51E-09	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	2.E-09
	Benzo(k)fluoranthene	3.30E-01	mg/kg	3.30E-01	mg/kg	M	1.53E-09	mg/kg-day	7.3E-02	$(mg/kg\text{-}day)^{-1}$	1.E-10
	Chrysene	7.50E-01	mg/kg	7.50E-01	mg/kg	M	3.48E-09	mg/kg-day	7.3E-03	$(mg/kg\text{-}day)^{-1}$	3.E-11
	Dibenz(ah)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	1.02E-09	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	7.E-09
	Indeno(123-cd)pyrene	3.60E-01	mg/kg	3.60E-01	mg/kg	M	1.67E-09	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	1.E-09
	bis(2-Ethylhexyl)phthalate	3.40E+01	mg/kg	3.40E+01	mg/kg	M	1.58E-07	mg/kg-day	2.5E-02	$(mg/kg\text{-}day)^{-1}$	2.E-09
	Polychlorinated Biphenyls (3)	8.00E+01	mg/kg	8.00E+01	mg/kg	M	4.00E-07	mg/kg-day	1.0E+00	$(mg/kg\text{-}day)^{-1}$	4.E-07
	PCB-77	2.80E-01	mg/kg	2.80E-01	mg/kg	M	1.40E-09	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-08
	PCB-81	5.30E-02	mg/kg	5.30E-02	mg/kg	M	2.65E-10	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	4.E-09
	PCB-105	2.20E+00	mg/kg	2.20E+00	mg/kg	M	1.10E-08	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-07
	PCB-114	1.40E-01	mg/kg	1.40E-01	mg/kg	M	7.00E-10	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	5.E-08
	PCB-118	3.30E+00	mg/kg	3.30E+00	mg/kg	M	1.65E-08	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-07
	PCB-123	1.80E-01	mg/kg	1.80E-01	mg/kg	M	9.00E-10	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	1.E-08
	PCB-126	7.60E-03	mg/kg	7.60E-03	mg/kg	M	3.80E-11	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	6.E-07
	PCB-156	5.00E-02	mg/kg	5.00E-02	mg/kg	M	2.50E-10	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-08
	PCB-157	1.10E-02	mg/kg	1.10E-02	mg/kg	M	5.50E-11	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	4.E-09
	PCB-167	8.70E-02	mg/kg	8.70E-02	mg/kg	M	4.35E-10	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	7.E-10
	PCB-189	3.00E-03	mg/kg	3.00E-03	mg/kg	M	1.50E-11	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-10
	2,3,7,8-TCDD	3.00E-07	mg/kg	3.00E-07	mg/kg	M	3.21E-16	mg/kg-day	1.5E+05	$(mg/kg\text{-}day)^{-1}$	5.E-11
	1,2,3,7,8-PeCDD	1.80E-06	mg/kg	1.80E-06	mg/kg	M	1.93E-15	mg/kg-day	1.5E+05	$(mg/kg\text{-}day)^{-1}$	3.E-10
	1,2,3,4,7,8-HxCDD	2.90E-06	mg/kg	2.90E-06	mg/kg	M	3.11E-15	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	5.E-11
	1,2,3,6,7,8-HxCDD	7.70E-06	mg/kg	7.70E-06	mg/kg	M	8.25E-15	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	1.E-10
	1,2,3,7,8,9-HxCDD	5.70E-06	mg/kg	5.70E-06	mg/kg	M	6.10E-15	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	9.E-11
	1,2,3,4,6,7,8-HpCDD	1.30E-04	mg/kg	1.30E-04	mg/kg	M	1.39E-13	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	2.E-10
	OCDD	1.00E-03	mg/kg	1.00E-03	mg/kg	M	1.07E-12	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-11
	2,3,7,8-TCDF	2.00E-05	mg/kg	2.00E-05	mg/kg	M	2.14E-14	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	3.E-10
	1,2,3,7,8-PeCDF	7.70E-06	mg/kg	7.70E-06	mg/kg	M	8.25E-15	mg/kg-day	7.5E+03	$(mg/kg\text{-}day)^{-1}$	6.E-11
	2,3,4,7,8-PeCDF	5.50E-05	mg/kg	5.50E-05	mg/kg	M	5.89E-14	mg/kg-day	7.5E+04	$(mg/kg\text{-}day)^{-1}$	4.E-09
	1,2,3,4,7,8-HxCDF	1.50E-05	mg/kg	1.50E-05	mg/kg	M	1.61E-14	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	2.E-10
	1,2,3,6,7,8-HxCDF	8.80E-06	mg/kg	8.80E-06	mg/kg	M	9.42E-15	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	1.E-10
	1,2,3,7,8,9-HxCDF	4.30E-06	mg/kg	4.30E-06	mg/kg	M	4.60E-15	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	7.E-11
	2,3,4,6,7,8-HxCDF	1.00E-05	mg/kg	1.00E-05	mg/kg	M	1.07E-14	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	2.E-10
	1,2,3,4,6,7,8-HpCDF	3.40E-05	mg/kg	3.40E-05	mg/kg	M	3.64E-14	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	5.E-11
	1,2,3,4,7,8,9-HpCDF	3.80E-06	mg/kg	3.80E-06	mg/kg	M	4.07E-15	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	6.E-12
	OCDF	5.20E-05	mg/kg	5.20E-05	mg/kg	M	5.57E-14	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	8.E-13
	Arsenic	6.60E+00	mg/kg	6.60E+00	mg/kg	M	7.07E-09	mg/kg-day	1.6E+00	$(mg/kg\text{-}day)^{-1}$	1.E-08
	Beryllium	4.00E-01	mg/kg	4.00E-01	mg/kg	M	1.43E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Cadmium (Food)	1.30E+00	mg/kg	1.30E+00	mg/kg	M	4.64E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Chromium VI (particulates)	2.60E+01	mg/kg	2.60E+01	mg/kg	M	9.28E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Lead	4.90E+02	mg/kg	4.90E+02	mg/kg	M	1.75E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Mercury	6.10E+00	mg/kg	6.10E+00	mg/kg	M	2.18E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	(Total)										2.E-06
										Total Risk Across Direct Exposure Routes/Pathways	1.E-04
										Total Risk Across All Exposure Routes/Pathways	2.E-04

(1) COPCs shown in this table are carcinogens classifed as known (A), probable (B1, B2), possible (C), or "known/likely" under new EPA Cancer Guidelines.
(2) M indicates the Medium EPC was used while R indicates the Route EPC was used.
(3) The Polychlorinated Biphenyls (PCBs) risk is from the total PCB concentration minus the concentration of dioxin-like congeners.
(4) The "Total Risk Across Direct Exposure Routes/Pathways" is the risk from the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.
The "Total Risk Across All Exposure Routes/Pathways" is the risk from the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.

TABLE 8.2.RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Surface and Subsurface Soil
Exposure Point: 0 to 10 foot soil
Receptor Population: Resident
Receptor Age: Child

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (2)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (4)
Soil Ingestion	Tetrachloroethene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	6.51E-08	mg/kg-day	5.2E-02	$(mg/kg\text{-}day)^{-1}$	3.E-09
	Naphthalene	8.00E-01	mg/kg	8.00E-01	mg/kg	M	4.01E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Benz(a)anthracene	8.80E-01	mg/kg	8.80E-01	mg/kg	M	4.41E-07	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	3.E-07
	Benzo(a)pyrene	2.00E+00	mg/kg	2.00E+00	mg/kg	M	1.00E-06	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	7.E-06
	Benzo(b)fluoranthene	5.40E-01	mg/kg	5.40E-01	mg/kg	M	2.71E-07	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	2.E-07
	Benzo(k)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	8.52E-07	mg/kg-day	7.3E-02	$(mg/kg\text{-}day)^{-1}$	6.E-08
	Chrysene	7.50E-01	mg/kg	7.50E-01	mg/kg	M	3.76E-07	mg/kg-day	7.3E-03	$(mg/kg\text{-}day)^{-1}$	3.E-09
	Dibenz(ah)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	1.10E-07	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	8.E-07
	Indeno(123-cd)pyrene	3.60E-01	mg/kg	3.60E-01	mg/kg	M	1.80E-07	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	1.E-07
	bis(2-Ethylhexyl)phthalate	3.40E+01	mg/kg	3.40E+01	mg/kg	M	1.70E-05	mg/kg-day	1.4E-02	$(mg/kg\text{-}day)^{-1}$	2.E-07
	Polychlorinated Biphenyls (3)	8.00E+01	mg/kg	8.00E+01	mg/kg	M	4.01E-05	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	8.E-05
	PCB-77	3.00E+00	mg/kg	3.00E+00	mg/kg	M	1.50E-06	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-05
	PCB-81	5.30E-02	mg/kg	5.30E-02	mg/kg	M	2.66E-08	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	4.E-07
	PCB-105	2.20E+00	mg/kg	2.20E+00	mg/kg	M	1.10E-06	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-05
	PCB-114	1.40E-01	mg/kg	1.40E-01	mg/kg	M	7.01E-08	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	5.E-06
	PCB-118	3.30E+00	mg/kg	3.30E+00	mg/kg	M	1.65E-06	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-05
	PCB-123	1.80E-01	mg/kg	1.80E-01	mg/kg	M	9.02E-08	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	1.E-06
	PCB-126	7.60E-03	mg/kg	7.60E-03	mg/kg	M	3.81E-09	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	6.E-05
	PCB-156	5.00E-02	mg/kg	5.00E-02	mg/kg	M	2.50E-08	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-06
	PCB-157	1.10E-02	mg/kg	1.10E-02	mg/kg	M	5.51E-09	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	4.E-07
	PCB-167	8.70E-02	mg/kg	8.70E-02	mg/kg	M	4.36E-08	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	7.E-08
	PCB-189	3.00E-03	mg/kg	3.00E-03	mg/kg	M	1.50E-09	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-12
	2,3,7,8-TCDD	3.90E-07	mg/kg	3.90E-07	mg/kg	M	1.95E-13	mg/kg-day	1.5E+05	$(mg/kg\text{-}day)^{-1}$	3.E-08
	1,2,3,7,8-PeCDD	3.60E-06	mg/kg	3.60E-06	mg/kg	M	1.80E-12	mg/kg-day	1.5E+05	$(mg/kg\text{-}day)^{-1}$	3.E-07
	1,2,3,4,7,8-HxCDD	5.10E-06	mg/kg	5.10E-06	mg/kg	M	2.55E-12	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	4.E-08
	1,2,3,6,7,8-HxCDD	1.20E-05	mg/kg	1.20E-05	mg/kg	M	6.01E-12	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	9.E-08
	1,2,3,7,8,9-HxCDD	1.00E-05	mg/kg	1.00E-05	mg/kg	M	5.01E-12	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	8.E-08
	1,2,3,4,6,7,8-HpCDD	2.50E-04	mg/kg	2.50E-04	mg/kg	M	1.25E-10	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	2.E-07
	OCDD	2.00E-03	mg/kg	2.00E-03	mg/kg	M	1.00E-09	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-08
	2,3,7,8-TCDF	5.90E-05	mg/kg	5.90E-05	mg/kg	M	2.96E-11	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	4.E-07
	1,2,3,7,8-PeCDF	2.20E-05	mg/kg	2.20E-05	mg/kg	M	1.10E-11	mg/kg-day	7.5E+03	$(mg/kg\text{-}day)^{-1}$	8.E-08
	2,3,4,7,8-PeCDF	1.40E-04	mg/kg	1.40E-04	mg/kg	M	7.01E-11	mg/kg-day	7.5E+04	$(mg/kg\text{-}day)^{-1}$	5.E-06
	1,2,3,4,7,8-HxCDF	3.20E-05	mg/kg	3.20E-05	mg/kg	M	1.60E-11	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	2.E-07
	1,2,3,6,7,8-HxCDF	1.90E-05	mg/kg	1.90E-05	mg/kg	M	9.52E-12	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	1.E-07
	1,2,3,7,8,9-HxCDF	1.10E-05	mg/kg	1.10E-05	mg/kg	M	5.51E-12	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	8.E-08
	2,3,4,6,7,8-HxCDF	2.10E-05	mg/kg	2.10E-05	mg/kg	M	1.05E-11	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	2.E-07
	1,2,3,4,6,7,8-HpCDF	6.30E-05	mg/kg	6.30E-05	mg/kg	M	3.16E-11	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	5.E-08
	1,2,3,4,7,8,9-HpCDF	7.80E-06	mg/kg	7.80E-06	mg/kg	M	3.91E-12	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	6.E-09
	OCDF	1.00E-04	mg/kg	1.00E-04	mg/kg	M	5.01E-11	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	8.E-10
	Arsenic	6.60E+00	mg/kg	6.60E+00	mg/kg	M	3.31E-06	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	5.E-06
	Beryllium	1.80E+00	mg/kg	1.80E+00	mg/kg	M	9.02E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Cadmium (Food)	4.40E+01	mg/kg	4.40E+01	mg/kg	M	2.20E-05	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Chromium VI (particulates)	5.30E+02	mg/kg	5.30E+02	mg/kg	M	2.66E-04	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Lead	4.90E+02	mg/kg	4.90E+02	mg/kg	M	2.45E-04	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Mercury	2.40E+01	mg/kg	2.40E+01	mg/kg	M	1.20E-05	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	(Total)										2.E-04
										Total Risk Across Direct Exposure Routes/Pathways	2.E-02
										Total Risk Across All Exposure Routes/Pathways	3.E-02

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (2)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (4)
Soil	Tetrachloroethene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	0.00E+00	mg/kg-day	5.2E-02	(mg/kg-day)$^{-1}$	---
Dermal	Naphthalene	8.00E-01	mg/kg	8.00E-01	mg/kg	M	1.16E-06	mg/kg-day	NA	(mg/kg-day)$^{-1}$	---
	Benz(a)anthracene	8.80E-01	mg/kg	8.80E-01	mg/kg	M	1.66E-07	mg/kg-day	7.3E-01	(mg/kg-day)$^{-1}$	1.E-07
	Benzo(a)pyrene	2.00E+00	mg/kg	2.00E+00	mg/kg	M	3.78E-07	mg/kg-day	7.3E+00	(mg/kg-day)$^{-1}$	3.E-06
	Benzo(b)fluoranthene	5.40E-01	mg/kg	5.40E-01	mg/kg	M	1.02E-07	mg/kg-day	7.3E-01	(mg/kg-day)$^{-1}$	7.E-08
	Benzo(k)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	3.21E-07	mg/kg-day	7.3E-02	(mg/kg-day)$^{-1}$	2.E-08
	Chrysene	7.50E-01	mg/kg	7.50E-01	mg/kg	M	1.42E-07	mg/kg-day	7.3E-03	(mg/kg-day)$^{-1}$	1.E-09
	Dibenz(ah)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	4.16E-08	mg/kg-day	7.3E+00	(mg/kg-day)$^{-1}$	3.E-07
	Indeno(123-cd)pyrene	3.60E-01	mg/kg	3.60E-01	mg/kg	M	6.80E-08	mg/kg-day	7.3E-01	(mg/kg-day)$^{-1}$	5.E-08
	bis(2-Ethylhexyl)phthalate	3.40E+01	mg/kg	3.40E+01	mg/kg	M	6.42E-06	mg/kg-day	2.5E-02	(mg/kg-day)$^{-1}$	9.E-08
	Polychlorinated Biphenyls (3)	8.00E+01	mg/kg	8.00E+01	mg/kg	M	1.63E-05	mg/kg-day	2.0E+00	(mg/kg-day)$^{-1}$	3.E-05
	PCB-77	3.00E+00	mg/kg	3.00E+00	mg/kg	M	6.10E-07	mg/kg-day	1.5E+01	(mg/kg-day)$^{-1}$	9.E-06
	PCB-81	5.30E-02	mg/kg	5.30E-02	mg/kg	M	1.08E-08	mg/kg-day	1.5E+01	(mg/kg-day)$^{-1}$	2.E-07
	PCB-105	2.20E+00	mg/kg	2.20E+00	mg/kg	M	4.47E-07	mg/kg-day	1.5E+01	(mg/kg-day)$^{-1}$	7.E-06
	PCB-114	1.40E-01	mg/kg	1.40E-01	mg/kg	M	2.85E-08	mg/kg-day	7.5E+01	(mg/kg-day)$^{-1}$	2.E-06
	PCB-118	3.30E+00	mg/kg	3.30E+00	mg/kg	M	6.71E-07	mg/kg-day	1.5E+01	(mg/kg-day)$^{-1}$	1.E-05
	PCB-123	1.80E-01	mg/kg	1.80E-01	mg/kg	M	3.66E-08	mg/kg-day	1.5E+01	(mg/kg-day)$^{-1}$	5.E-07
	PCB-126	7.60E-03	mg/kg	7.60E-03	mg/kg	M	1.55E-09	mg/kg-day	1.5E+04	(mg/kg-day)$^{-1}$	2.E-05
	PCB-156	5.00E-02	mg/kg	5.00E-02	mg/kg	M	1.02E-08	mg/kg-day	7.5E+01	(mg/kg-day)$^{-1}$	8.E-07
	PCB-157	1.10E-02	mg/kg	1.10E-02	mg/kg	M	2.24E-09	mg/kg-day	7.5E+01	(mg/kg-day)$^{-1}$	2.E-07
	PCB-167	8.70E-02	mg/kg	8.70E-02	mg/kg	M	1.77E-08	mg/kg-day	1.5E+00	(mg/kg-day)$^{-1}$	3.E-08
	PCB-189	3.00E-03	mg/kg	3.00E-03	mg/kg	M	6.10E-10	mg/kg-day	1.5E+01	(mg/kg-day)$^{-1}$	9.E-09
	2,3,7,8-TCDD	3.90E-07	mg/kg	3.90E-07	mg/kg	M	1.70E-14	mg/kg-day	1.5E+05	(mg/kg-day)$^{-1}$	3.E-09
	1,2,3,7,8-PeCDD	3.60E-06	mg/kg	3.60E-06	mg/kg	M	1.57E-13	mg/kg-day	1.5E+05	(mg/kg-day)$^{-1}$	2.E-08
	1,2,3,4,7,8-HxCDD	5.10E-06	mg/kg	5.10E-06	mg/kg	M	2.22E-13	mg/kg-day	1.5E+04	(mg/kg-day)$^{-1}$	3.E-09
	1,2,3,6,7,8-HxCDD	1.20E-05	mg/kg	1.20E-05	mg/kg	M	5.23E-13	mg/kg-day	1.5E+04	(mg/kg-day)$^{-1}$	8.E-09
	1,2,3,7,8,9-HxCDD	1.00E-05	mg/kg	1.00E-05	mg/kg	M	4.36E-13	mg/kg-day	1.5E+04	(mg/kg-day)$^{-1}$	7.E-09
	1,2,3,4,6,7,8-HpCDD	2.50E-04	mg/kg	2.50E-04	mg/kg	M	1.09E-11	mg/kg-day	1.5E+03	(mg/kg-day)$^{-1}$	2.E-08
	OCDD	2.00E-03	mg/kg	2.00E-03	mg/kg	M	8.72E-11	mg/kg-day	1.5E+01	(mg/kg-day)$^{-1}$	1.E-09
	2,3,7,8-TCDF	5.90E-05	mg/kg	5.90E-05	mg/kg	M	2.57E-12	mg/kg-day	1.5E+04	(mg/kg-day)$^{-1}$	4.E-08
	1,2,3,7,8-PeCDF	2.20E-05	mg/kg	2.20E-05	mg/kg	M	9.59E-13	mg/kg-day	7.5E+03	(mg/kg-day)$^{-1}$	7.E-09
	2,3,4,7,8-PeCDF	1.40E-04	mg/kg	1.40E-04	mg/kg	M	6.10E-12	mg/kg-day	7.5E+04	(mg/kg-day)$^{-1}$	5.E-07
	1,2,3,4,7,8-HxCDF	3.20E-05	mg/kg	3.20E-05	mg/kg	M	1.39E-12	mg/kg-day	1.5E+04	(mg/kg-day)$^{-1}$	2.E-08
	1,2,3,6,7,8-HxCDF	1.90E-05	mg/kg	1.90E-05	mg/kg	M	8.28E-13	mg/kg-day	1.5E+04	(mg/kg-day)$^{-1}$	1.E-08
	1,2,3,7,8,9-HxCDF	1.10E-05	mg/kg	1.10E-05	mg/kg	M	4.79E-13	mg/kg-day	1.5E+04	(mg/kg-day)$^{-1}$	7.E-09
	2,3,4,6,7,8-HxCDF	2.10E-05	mg/kg	2.10E-05	mg/kg	M	9.15E-13	mg/kg-day	1.5E+04	(mg/kg-day)$^{-1}$	1.E-08
	1,2,3,4,6,7,8-HpCDF	6.30E-05	mg/kg	6.30E-05	mg/kg	M	2.75E-12	mg/kg-day	1.5E+03	(mg/kg-day)$^{-1}$	4.E-09
	1,2,3,4,7,8,9-HpCDF	7.80E-06	mg/kg	7.80E-06	mg/kg	M	3.40E-13	mg/kg-day	1.5E+03	(mg/kg-day)$^{-1}$	5.E-10
	OCDF	1.00E-04	mg/kg	1.00E-04	mg/kg	M	4.36E-12	mg/kg-day	1.5E+01	(mg/kg-day)$^{-1}$	7.E-11
	Arsenic	6.60E+00	mg/kg	6.60E+00	mg/kg	M	2.88E-07	mg/kg-day	1.6E+00	(mg/kg-day)$^{-1}$	5.E-07
	Beryllium	1.80E+00	mg/kg	1.80E+00	mg/kg	M	2.62E-08	mg/kg-day	NA	(mg/kg-day)$^{-1}$	---
	Cadmium (Food)	4.40E+01	mg/kg	4.40E+01	mg/kg	M	6.39E-07	mg/kg-day	NA	(mg/kg-day)$^{-1}$	---
	Chromium VI (particulates)	5.30E+02	mg/kg	5.30E+02	mg/kg	M	7.70E-06	mg/kg-day	NA	(mg/kg-day)$^{-1}$	---
	Lead	4.90E+02	mg/kg	4.90E+02	mg/kg	M	7.12E-06	mg/kg-day	NA	(mg/kg-day)$^{-1}$	---
	Mercury	2.40E+01	mg/kg	2.40E+01	mg/kg	M	3.49E-07	mg/kg-day	NA	(mg/kg-day)$^{-1}$	---
	(Total)										9.E-05
										Total Risk Across Direct Exposure Routes/Pathways	2.E-02
										Total Risk Across All Exposure Routes/Pathways	3.E-02

(1) COPCs shown in this table are carcinogens classifed as known (A), probable (B1, B2), possible (C), or "known/likely" under new EPA Cancer Guidelines.
(2) M indicates the Medium EPC was used while R indicates the Route EPC was used.
(3) The Polychlorinated Biphenyls (PCBs) risk is from the total PCB concentration minus the concentration of dioxin-like congeners.
(4) The "Total Risk Across Direct Exposure Routes/Pathways" is the risk from the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.
The "Total Risk Across All Exposure Routes/Pathways" is the risk from the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.

TABLE 8.2.CT
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Surface and Subsurface Soil
Exposure Point: 0 to 10 foot soil
Receptor Population: Resident
Receptor Age: Child

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (2)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (4)
Soil Ingestion	Tetrachloroethene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	1.09E-08	mg/kg-day	5.2E-02	(mg/kg-day)$^{-1}$	6.E-10
	Naphthalene	8.00E-01	mg/kg	8.00E-01	mg/kg	M	6.68E-08	mg/kg-day	NA	(mg/kg-day)$^{-1}$	---
	Benz(a)anthracene	8.80E-01	mg/kg	8.80E-01	mg/kg	M	7.35E-08	mg/kg-day	7.3E-01	(mg/kg-day)$^{-1}$	5.E-08
	Benzo(a)pyrene	3.70E-01	mg/kg	3.70E-01	mg/kg	M	3.09E-08	mg/kg-day	7.3E+00	(mg/kg-day)$^{-1}$	2.E-07
	Benzo(b)fluoranthene	5.40E-01	mg/kg	5.40E-01	mg/kg	M	4.51E-08	mg/kg-day	7.3E-01	(mg/kg-day)$^{-1}$	3.E-08
	Benzo(k)fluoranthene	3.30E-01	mg/kg	3.30E-01	mg/kg	M	2.76E-08	mg/kg-day	7.3E-02	(mg/kg-day)$^{-1}$	2.E-09
	Chrysene	7.50E-01	mg/kg	7.50E-01	mg/kg	M	6.26E-08	mg/kg-day	7.3E-03	(mg/kg-day)$^{-1}$	5.E-10
	Dibenz(ah)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	1.84E-08	mg/kg-day	7.3E+00	(mg/kg-day)$^{-1}$	1.E-07
	Indeno(123-cd)pyrene	3.60E-01	mg/kg	3.60E-01	mg/kg	M	3.01E-08	mg/kg-day	7.3E-01	(mg/kg-day)$^{-1}$	2.E-08
	bis(2-Ethylhexyl)phthalate	3.40E+01	mg/kg	3.40E+01	mg/kg	M	2.84E-06	mg/kg-day	1.4E-02	(mg/kg-day)$^{-1}$	4.E-08
	Polychlorinated Biphenyls (3)	8.00E+01	mg/kg	8.00E+01	mg/kg	M	6.68E-06	mg/kg-day	1.0E+00	(mg/kg-day)$^{-1}$	7.E-06
	PCB-77	2.80E-01	mg/kg	2.80E-01	mg/kg	M	2.34E-08	mg/kg-day	1.5E+01	(mg/kg-day)$^{-1}$	4.E-07
	PCB-81	5.30E-02	mg/kg	5.30E-02	mg/kg	M	4.43E-09	mg/kg-day	1.5E+01	(mg/kg-day)$^{-1}$	7.E-08
	PCB-105	2.20E+00	mg/kg	2.20E+00	mg/kg	M	1.84E-07	mg/kg-day	1.5E+01	(mg/kg-day)$^{-1}$	3.E-06
	PCB-114	1.40E-01	mg/kg	1.40E-01	mg/kg	M	1.17E-08	mg/kg-day	7.5E+01	(mg/kg-day)$^{-1}$	9.E-07
	PCB-118	3.30E+00	mg/kg	3.30E+00	mg/kg	M	2.76E-07	mg/kg-day	1.5E+01	(mg/kg-day)$^{-1}$	4.E-06
	PCB-123	1.80E-01	mg/kg	1.80E-01	mg/kg	M	1.50E-08	mg/kg-day	1.5E+01	(mg/kg-day)$^{-1}$	2.E-07
	PCB-126	7.60E-03	mg/kg	7.60E-03	mg/kg	M	6.35E-10	mg/kg-day	1.5E+04	(mg/kg-day)$^{-1}$	1.E-05
	PCB-156	5.00E-02	mg/kg	5.00E-02	mg/kg	M	4.17E-09	mg/kg-day	7.5E+01	(mg/kg-day)$^{-1}$	3.E-07
	PCB-157	1.10E-02	mg/kg	1.10E-02	mg/kg	M	9.18E-10	mg/kg-day	7.5E+01	(mg/kg-day)$^{-1}$	7.E-08
	PCB-167	8.70E-02	mg/kg	8.70E-02	mg/kg	M	7.26E-09	mg/kg-day	1.5E+00	(mg/kg-day)$^{-1}$	1.E-08
	PCB-189	3.00E-03	mg/kg	3.00E-03	mg/kg	M	2.50E-10	mg/kg-day	1.5E+01	(mg/kg-day)$^{-1}$	4.E-13
	2,3,7,8-TCDD	3.00E-07	mg/kg	3.00E-07	mg/kg	M	2.50E-14	mg/kg-day	1.5E+05	(mg/kg-day)$^{-1}$	4.E-09
	1,2,3,7,8-PeCDD	1.80E-06	mg/kg	1.80E-06	mg/kg	M	1.50E-13	mg/kg-day	1.5E+05	(mg/kg-day)$^{-1}$	2.E-08
	1,2,3,4,7,8-HxCDD	2.90E-06	mg/kg	2.90E-06	mg/kg	M	2.42E-13	mg/kg-day	1.5E+04	(mg/kg-day)$^{-1}$	4.E-09
	1,2,3,6,7,8-HxCDD	7.70E-06	mg/kg	7.70E-06	mg/kg	M	6.43E-13	mg/kg-day	1.5E+04	(mg/kg-day)$^{-1}$	1.E-08
	1,2,3,7,8,9-HxCDD	5.70E-06	mg/kg	5.70E-06	mg/kg	M	4.76E-13	mg/kg-day	1.5E+04	(mg/kg-day)$^{-1}$	7.E-09
	1,2,3,4,6,7,8-HpCDD	1.30E-04	mg/kg	1.30E-04	mg/kg	M	1.09E-11	mg/kg-day	1.5E+03	(mg/kg-day)$^{-1}$	2.E-08
	OCDD	1.00E-03	mg/kg	1.00E-03	mg/kg	M	8.35E-11	mg/kg-day	1.5E+01	(mg/kg-day)$^{-1}$	1.E-09
	2,3,7,8-TCDF	2.00E-05	mg/kg	2.00E-05	mg/kg	M	1.67E-12	mg/kg-day	1.5E+04	(mg/kg-day)$^{-1}$	3.E-08
	1,2,3,7,8-PeCDF	7.70E-06	mg/kg	7.70E-06	mg/kg	M	6.43E-13	mg/kg-day	7.5E+03	(mg/kg-day)$^{-1}$	5.E-09
	2,3,4,7,8-PeCDF	5.50E-05	mg/kg	5.50E-05	mg/kg	M	4.59E-12	mg/kg-day	7.5E+04	(mg/kg-day)$^{-1}$	3.E-07
	1,2,3,4,7,8-HxCDF	1.50E-05	mg/kg	1.50E-05	mg/kg	M	1.25E-12	mg/kg-day	1.5E+04	(mg/kg-day)$^{-1}$	2.E-08
	1,2,3,6,7,8-HxCDF	8.80E-06	mg/kg	8.80E-06	mg/kg	M	7.35E-13	mg/kg-day	1.5E+04	(mg/kg-day)$^{-1}$	1.E-08
	1,2,3,7,8,9-HxCDF	4.30E-06	mg/kg	4.30E-06	mg/kg	M	3.59E-13	mg/kg-day	1.5E+04	(mg/kg-day)$^{-1}$	5.E-09
	2,3,4,6,7,8-HxCDF	1.00E-05	mg/kg	1.00E-05	mg/kg	M	8.35E-13	mg/kg-day	1.5E+04	(mg/kg-day)$^{-1}$	1.E-08
	1,2,3,4,6,7,8-HpCDF	3.40E-05	mg/kg	3.40E-05	mg/kg	M	2.84E-12	mg/kg-day	1.5E+03	(mg/kg-day)$^{-1}$	4.E-09
	1,2,3,4,7,8,9-HpCDF	3.80E-06	mg/kg	3.80E-06	mg/kg	M	3.17E-13	mg/kg-day	1.5E+03	(mg/kg-day)$^{-1}$	5.E-10
	OCDF	5.20E-05	mg/kg	5.20E-05	mg/kg	M	4.34E-12	mg/kg-day	1.5E+01	(mg/kg-day)$^{-1}$	7.E-11
	Arsenic	6.60E+00	mg/kg	6.60E+00	mg/kg	M	5.51E-07	mg/kg-day	1.5E+00	(mg/kg-day)$^{-1}$	8.E-07
	Beryllium	4.00E-01	mg/kg	4.00E-01	mg/kg	M	3.34E-08	mg/kg-day	NA	(mg/kg-day)$^{-1}$	---
	Cadmium (Food)	1.30E+00	mg/kg	1.30E+00	mg/kg	M	1.09E-07	mg/kg-day	NA	(mg/kg-day)$^{-1}$	---
	Chromium VI (particulates)	2.60E+01	mg/kg	2.60E+01	mg/kg	M	2.17E-06	mg/kg-day	NA	(mg/kg-day)$^{-1}$	---
	Lead	4.90E+02	mg/kg	4.90E+02	mg/kg	M	4.09E-05	mg/kg-day	NA	(mg/kg-day)$^{-1}$	---
	Mercury	6.10E+00	mg/kg	6.10E+00	mg/kg	M	5.09E-07	mg/kg-day	NA	(mg/kg-day)$^{-1}$	---
	(Total)										3.E-05
										Total Risk Across Direct Exposure Routes/Pathways	1.E-04
										Total Risk Across All Exposure Routes/Pathways	2.E-04

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (2)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (4)
Soil	Tetrachloroethene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	0.00E+00	mg/kg-day	5.2E-02	(mg/kg-day)$^{-1}$	---
Dermal	Naphthalene	8.00E-01	mg/kg	8.00E-01	mg/kg	M	1.16E-07	mg/kg-day	NA	(mg/kg-day)$^{-1}$	---
	Benz(a)anthracene	8.80E-01	mg/kg	8.80E-01	mg/kg	M	1.66E-08	mg/kg-day	7.3E-01	(mg/kg-day)$^{-1}$	1.E-08
	Benzo(a)pyrene	3.70E-01	mg/kg	3.70E-01	mg/kg	M	6.99E-09	mg/kg-day	7.3E+00	(mg/kg-day)$^{-1}$	5.E-08
	Benzo(b)fluoranthene	5.40E-01	mg/kg	5.40E-01	mg/kg	M	1.02E-08	mg/kg-day	7.3E-01	(mg/kg-day)$^{-1}$	7.E-09
	Benzo(k)fluoranthene	3.30E-01	mg/kg	3.30E-01	mg/kg	M	6.23E-09	mg/kg-day	7.3E-02	(mg/kg-day)$^{-1}$	5.E-10
	Chrysene	7.50E-01	mg/kg	7.50E-01	mg/kg	M	1.42E-08	mg/kg-day	7.3E-03	(mg/kg-day)$^{-1}$	1.E-10
	Dibenz(ah)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	4.16E-09	mg/kg-day	7.3E+00	(mg/kg-day)$^{-1}$	3.E-08
	Indeno(123-cd)pyrene	3.60E-01	mg/kg	3.60E-01	mg/kg	M	6.80E-09	mg/kg-day	7.3E-01	(mg/kg-day)$^{-1}$	5.E-09
	bis(2-Ethylhexyl)phthalate	3.40E+01	mg/kg	3.40E+01	mg/kg	M	6.42E-07	mg/kg-day	2.5E-02	(mg/kg-day)$^{-1}$	9.E-09
	Polychlorinated Biphenyls (3)	8.00E+01	mg/kg	8.00E+01	mg/kg	M	1.63E-06	mg/kg-day	1.0E+00	(mg/kg-day)$^{-1}$	2.E-06
	PCB-77	2.80E-01	mg/kg	2.80E-01	mg/kg	M	5.70E-09	mg/kg-day	1.5E+01	(mg/kg-day)$^{-1}$	9.E-08
	PCB-81	5.30E-02	mg/kg	5.30E-02	mg/kg	M	1.08E-09	mg/kg-day	1.5E+01	(mg/kg-day)$^{-1}$	2.E-08
	PCB-105	2.20E+00	mg/kg	2.20E+00	mg/kg	M	4.47E-08	mg/kg-day	1.5E+01	(mg/kg-day)$^{-1}$	7.E-07
	PCB-114	1.40E-01	mg/kg	1.40E-01	mg/kg	M	2.85E-09	mg/kg-day	7.5E+01	(mg/kg-day)$^{-1}$	2.E-07
	PCB-118	3.30E+00	mg/kg	3.30E+00	mg/kg	M	6.71E-08	mg/kg-day	1.5E+01	(mg/kg-day)$^{-1}$	1.E-06
	PCB-123	1.80E-01	mg/kg	1.80E-01	mg/kg	M	3.66E-09	mg/kg-day	1.5E+01	(mg/kg-day)$^{-1}$	5.E-08
	PCB-126	7.60E-03	mg/kg	7.60E-03	mg/kg	M	1.55E-10	mg/kg-day	1.5E+04	(mg/kg-day)$^{-1}$	2.E-06
	PCB-156	5.00E-02	mg/kg	5.00E-02	mg/kg	M	1.02E-09	mg/kg-day	7.5E+01	(mg/kg-day)$^{-1}$	8.E-08
	PCB-157	1.10E-02	mg/kg	1.10E-02	mg/kg	M	2.24E-10	mg/kg-day	7.5E+01	(mg/kg-day)$^{-1}$	2.E-08
	PCB-167	8.70E-02	mg/kg	8.70E-02	mg/kg	M	1.77E-09	mg/kg-day	1.5E+00	(mg/kg-day)$^{-1}$	3.E-09
	PCB-189	3.00E-03	mg/kg	3.00E-03	mg/kg	M	6.10E-11	mg/kg-day	1.5E+01	(mg/kg-day)$^{-1}$	9.E-10
	2,3,7,8-TCDD	3.00E-07	mg/kg	3.00E-07	mg/kg	M	1.31E-15	mg/kg-day	1.5E+05	(mg/kg-day)$^{-1}$	2.E-10
	1,2,3,7,8-PeCDD	1.80E-06	mg/kg	1.80E-06	mg/kg	M	7.85E-15	mg/kg-day	1.5E+05	(mg/kg-day)$^{-1}$	1.E-09
	1,2,3,4,7,8-HxCDD	2.90E-06	mg/kg	2.90E-06	mg/kg	M	1.26E-14	mg/kg-day	1.5E+04	(mg/kg-day)$^{-1}$	2.E-10
	1,2,3,6,7,8-HxCDD	7.70E-06	mg/kg	7.70E-06	mg/kg	M	3.36E-14	mg/kg-day	1.5E+04	(mg/kg-day)$^{-1}$	5.E-10
	1,2,3,7,8,9-HxCDD	5.70E-06	mg/kg	5.70E-06	mg/kg	M	2.48E-14	mg/kg-day	1.5E+04	(mg/kg-day)$^{-1}$	4.E-10
	1,2,3,4,6,7,8-HpCDD	1.30E-04	mg/kg	1.30E-04	mg/kg	M	5.67E-13	mg/kg-day	1.5E+03	(mg/kg-day)$^{-1}$	8.E-10
	OCDD	1.00E-03	mg/kg	1.00E-03	mg/kg	M	4.36E-12	mg/kg-day	1.5E+01	(mg/kg-day)$^{-1}$	7.E-11
	2,3,7,8-TCDF	2.00E-05	mg/kg	2.00E-05	mg/kg	M	8.72E-14	mg/kg-day	1.5E+04	(mg/kg-day)$^{-1}$	1.E-09
	1,2,3,7,8-PeCDF	7.70E-06	mg/kg	7.70E-06	mg/kg	M	3.36E-14	mg/kg-day	7.5E+03	(mg/kg-day)$^{-1}$	3.E-10
	2,3,4,7,8-PeCDF	5.50E-05	mg/kg	5.50E-05	mg/kg	M	2.40E-13	mg/kg-day	7.5E+04	(mg/kg-day)$^{-1}$	2.E-08
	1,2,3,4,7,8-HxCDF	1.50E-05	mg/kg	1.50E-05	mg/kg	M	6.54E-14	mg/kg-day	1.5E+04	(mg/kg-day)$^{-1}$	1.E-09
	1,2,3,6,7,8-HxCDF	8.80E-06	mg/kg	8.80E-06	mg/kg	M	3.84E-14	mg/kg-day	1.5E+04	(mg/kg-day)$^{-1}$	6.E-10
	1,2,3,7,8,9-HxCDF	4.30E-06	mg/kg	4.30E-06	mg/kg	M	1.87E-14	mg/kg-day	1.5E+04	(mg/kg-day)$^{-1}$	3.E-10
	2,3,4,6,7,8-HxCDF	1.00E-05	mg/kg	1.00E-05	mg/kg	M	4.36E-14	mg/kg-day	1.5E+04	(mg/kg-day)$^{-1}$	7.E-10
	1,2,3,4,6,7,8-HpCDF	3.40E-05	mg/kg	3.40E-05	mg/kg	M	1.48E-13	mg/kg-day	1.5E+03	(mg/kg-day)$^{-1}$	2.E-10
	1,2,3,4,7,8,9-HpCDF	3.80E-06	mg/kg	3.80E-06	mg/kg	M	1.66E-14	mg/kg-day	1.5E+03	(mg/kg-day)$^{-1}$	2.E-11
	OCDF	5.20E-05	mg/kg	5.20E-05	mg/kg	M	2.27E-13	mg/kg-day	1.5E+01	(mg/kg-day)$^{-1}$	3.E-12
	Arsenic	6.60E+00	mg/kg	6.60E+00	mg/kg	M	2.88E-08	mg/kg-day	1.6E+00	(mg/kg-day)$^{-1}$	5.E-08
	Beryllium	4.00E-01	mg/kg	4.00E-01	mg/kg	M	5.81E-10	mg/kg-day	NA	(mg/kg-day)$^{-1}$	---
	Cadmium (Food)	1.30E+00	mg/kg	1.30E+00	mg/kg	M	1.89E-09	mg/kg-day	NA	(mg/kg-day)$^{-1}$	---
	Chromium VI (particulates)	2.60E+01	mg/kg	2.60E+01	mg/kg	M	3.78E-08	mg/kg-day	NA	(mg/kg-day)$^{-1}$	---
	Lead	4.90E+02	mg/kg	4.90E+02	mg/kg	M	7.12E-07	mg/kg-day	NA	(mg/kg-day)$^{-1}$	---
	Mercury	6.10E+00	mg/kg	6.10E+00	mg/kg	M	8.86E-09	mg/kg-day	NA	(mg/kg-day)$^{-1}$	---
	(Total)										6.E-06
										Total Risk Across Direct Exposure Routes/Pathways	1.E-04
										Total Risk Across All Exposure Routes/Pathways	2.E-04

(1) COPCs shown in this table are carcinogens classifed as known (A), probable (B1, B2), possible (C), or "known/likely" under new EPA Cancer Guidelines.
(2) M indicates the Medium EPC was used while R indicates the Route EPC was used.
(3) The Polychlorinated Biphenyls (PCBs) risk is from the total PCB concentration minus the concentration of dioxin-like congeners.
(4) The "Total Risk Across Direct Exposure Routes/Pathways" is the risk from the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.
The "Total Risk Across All Exposure Routes/Pathways" is the risk from the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.

TABLE 8.3.RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: 0 to 1 foot soil
Receptor Population: Resident
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (2)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (4)
Soil Ingestion	Tetrachloroethene	2.30E+00	mg/kg	2.30E+00	mg/kg	M	4.94E-07	mg/kg-day	5.2E-02	$(mg/kg\text{-}day)^{-1}$	3.E-08
	Naphthalene	5.90E-01	mg/kg	5.90E-01	mg/kg	M	1.27E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Benz(a)anthracene	3.70E+00	mg/kg	3.70E+00	mg/kg	M	7.94E-07	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	6.E-07
	Benzo(a)pyrene	2.00E+00	mg/kg	2.00E+00	mg/kg	M	4.29E-07	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	3.E-06
	Benzo(b)fluoranthene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	2.58E-07	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	2.E-07
	Benzo(k)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	3.65E-07	mg/kg-day	7.3E-02	$(mg/kg\text{-}day)^{-1}$	3.E-08
	Chrysene	2.10E+00	mg/kg	2.10E+00	mg/kg	M	4.51E-07	mg/kg-day	7.3E-03	$(mg/kg\text{-}day)^{-1}$	3.E-09
	Dibenz(ah)anthracene	2.80E-01	mg/kg	2.80E-01	mg/kg	M	6.01E-08	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	4.E-07
	Indeno(123-cd)pyrene	6.60E-01	mg/kg	6.60E-01	mg/kg	M	1.42E-07	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	1.E-07
	bis(2-Ethylhexyl)phthalate	1.30E+02	mg/kg	1.30E+02	mg/kg	M	2.79E-05	mg/kg-day	1.4E-02	$(mg/kg\text{-}day)^{-1}$	4.E-07
	Polychlorinated Biphenyls (3)	3.70E+02	mg/kg	3.70E+02	mg/kg	M	7.94E-05	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	2.E-04
	PCB-77	3.00E+00	mg/kg	3.00E+00	mg/kg	M	6.44E-07	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	1.E-05
	PCB-81	9.80E-02	mg/kg	9.80E-02	mg/kg	M	2.10E-08	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	3.E-07
	PCB-105	4.40E+00	mg/kg	4.40E+00	mg/kg	M	9.45E-07	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	1.E-05
	PCB-114	4.40E-01	mg/kg	4.40E-01	mg/kg	M	9.45E-08	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	7.E-06
	PCB-118	7.20E+00	mg/kg	7.20E+00	mg/kg	M	1.55E-06	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-05
	PCB-123	7.40E-01	mg/kg	7.40E-01	mg/kg	M	1.59E-07	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-06
	PCB-126	2.80E-02	mg/kg	2.80E-02	mg/kg	M	6.01E-09	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	9.E-05
	PCB-156	2.20E-01	mg/kg	2.20E-01	mg/kg	M	4.72E-08	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	4.E-06
	PCB-157	5.40E-02	mg/kg	5.40E-02	mg/kg	M	1.16E-08	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	9.E-07
	PCB-167	4.20E-01	mg/kg	4.20E-01	mg/kg	M	9.02E-08	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	1.E-07
	PCB-189	8.30E-03	mg/kg	8.30E-03	mg/kg	M	1.78E-09	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	3.E-08
	2,3,7,8-TCDD	3.90E-07	mg/kg	3.90E-07	mg/kg	M	8.37E-14	mg/kg-day	1.5E+05	$(mg/kg\text{-}day)^{-1}$	1.E-08
	1,2,3,7,8-PeCDD	3.60E-06	mg/kg	3.60E-06	mg/kg	M	7.73E-13	mg/kg-day	1.5E+05	$(mg/kg\text{-}day)^{-1}$	1.E-07
	1,2,3,4,7,8-HxCDD	5.10E-06	mg/kg	5.10E-06	mg/kg	M	1.09E-12	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	2.E-08
	1,2,3,6,7,8-HxCDD	1.20E-05	mg/kg	1.20E-05	mg/kg	M	2.58E-12	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	4.E-08
	1,2,3,7,8,9-HxCDD	1.00E-05	mg/kg	1.00E-05	mg/kg	M	2.15E-12	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	3.E-08
	1,2,3,4,6,7,8-HpCDD	2.50E-04	mg/kg	2.50E-04	mg/kg	M	5.37E-11	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	8.E-08
	OCDD	2.00E-03	mg/kg	2.00E-03	mg/kg	M	4.29E-10	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	6.E-09
	2,3,7,8-TCDF	5.90E-05	mg/kg	5.90E-05	mg/kg	M	1.27E-11	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	2.E-07
	1,2,3,7,8-PeCDF	2.20E-05	mg/kg	2.20E-05	mg/kg	M	4.72E-12	mg/kg-day	7.5E+03	$(mg/kg\text{-}day)^{-1}$	4.E-08
	2,3,4,7,8-PeCDF	1.40E-04	mg/kg	1.40E-04	mg/kg	M	3.01E-11	mg/kg-day	7.5E+04	$(mg/kg\text{-}day)^{-1}$	2.E-06
	1,2,3,4,7,8-HxCDF	3.20E-05	mg/kg	3.20E-05	mg/kg	M	6.87E-12	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	1.E-07
	1,2,3,6,7,8-HxCDF	1.90E-05	mg/kg	1.90E-05	mg/kg	M	4.08E-12	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	6.E-08
	1,2,3,7,8,9-HxCDF	1.10E-05	mg/kg	1.10E-05	mg/kg	M	2.36E-12	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	4.E-08
	2,3,4,6,7,8-HxCDF	2.10E-05	mg/kg	2.10E-05	mg/kg	M	4.51E-12	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	7.E-08
	1,2,3,4,6,7,8-HpCDF	6.30E-05	mg/kg	6.30E-05	mg/kg	M	1.35E-11	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	2.E-08
	1,2,3,4,7,8,9-HpCDF	7.80E-06	mg/kg	7.80E-06	mg/kg	M	1.67E-12	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	3.E-09
	OCDF	1.00E-04	mg/kg	1.00E-04	mg/kg	M	2.15E-11	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	3.E-10
	Arsenic	7.00E+00	mg/kg	7.00E+00	mg/kg	M	1.50E-06	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	2.E-06
	Beryllium	3.60E-01	mg/kg	3.60E-01	mg/kg	M	7.73E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Cadmium (Food)	2.30E+01	mg/kg	2.30E+01	mg/kg	M	4.94E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Chromium VI (particulates)	5.30E+02	mg/kg	5.30E+02	mg/kg	M	1.14E-04	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Lead	9.00E+02	mg/kg	9.00E+02	mg/kg	M	1.93E-04	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Mercury	3.00E-01	mg/kg	3.00E-01	mg/kg	M	6.44E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	(Total)										3.E-04
										Total Risk Across Direct Exposure Routes/Pathways	2.E-02
										Total Risk Across All Exposure Routes/Pathways	4.E-02

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (2)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (4)
Soil	Tetrachloroethene	2.30E+00	mg/kg	2.30E+00	mg/kg	M	0.00E+00	mg/kg-day	5.2E-02	$(mg/kg\text{-}day)^{-1}$	---
Dermal	Naphthalene	5.90E-01	mg/kg	5.90E-01	mg/kg	M	5.05E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Benz(a)anthracene	3.70E+00	mg/kg	3.70E+00	mg/kg	M	4.12E-07	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	3.E-07
	Benzo(a)pyrene	2.00E+00	mg/kg	2.00E+00	mg/kg	M	2.23E-07	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	2.E-06
	Benzo(b)fluoranthene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	1.34E-07	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	1.E-07
	Benzo(k)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	1.89E-07	mg/kg-day	7.3E-02	$(mg/kg\text{-}day)^{-1}$	1.E-08
	Chrysene	2.10E+00	mg/kg	2.10E+00	mg/kg	M	2.34E-07	mg/kg-day	7.3E-03	$(mg/kg\text{-}day)^{-1}$	2.E-09
	Dibenz(ah)anthracene	2.80E-01	mg/kg	2.80E-01	mg/kg	M	3.12E-08	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	2.E-07
	Indeno(123-cd)pyrene	6.60E-01	mg/kg	6.60E-01	mg/kg	M	7.35E-08	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	5.E-08
	bis(2-Ethylhexyl)phthalate	1.30E+02	mg/kg	1.30E+02	mg/kg	M	1.45E-05	mg/kg-day	2.5E-02	$(mg/kg\text{-}day)^{-1}$	2.E-07
	Polychlorinated Biphenyls (3)	3.70E+02	mg/kg	3.70E+02	mg/kg	M	4.44E-05	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	9.E-05
	PCB-77	3.00E+00	mg/kg	3.00E+00	mg/kg	M	3.60E-07	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	5.E-06
	PCB-81	9.80E-02	mg/kg	9.80E-02	mg/kg	M	1.18E-08	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-07
	PCB-105	4.40E+00	mg/kg	4.40E+00	mg/kg	M	5.28E-07	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	8.E-06
	PCB-114	4.40E-01	mg/kg	4.40E-01	mg/kg	M	5.28E-08	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	4.E-06
	PCB-118	7.20E+00	mg/kg	7.20E+00	mg/kg	M	8.64E-07	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	1.E-05
	PCB-123	7.40E-01	mg/kg	7.40E-01	mg/kg	M	8.88E-08	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	1.E-06
	PCB-126	2.80E-02	mg/kg	2.80E-02	mg/kg	M	3.36E-09	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	5.E-05
	PCB-156	2.20E-01	mg/kg	2.20E-01	mg/kg	M	2.64E-08	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-06
	PCB-157	5.40E-02	mg/kg	5.40E-02	mg/kg	M	6.48E-09	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	5.E-07
	PCB-167	4.20E-01	mg/kg	4.20E-01	mg/kg	M	5.04E-08	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	8.E-08
	PCB-189	8.30E-03	mg/kg	8.30E-03	mg/kg	M	9.95E-10	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	1.E-08
	2,3,7,8-TCDD	3.90E-07	mg/kg	3.90E-07	mg/kg	M	1.00E-14	mg/kg-day	1.5E+05	$(mg/kg\text{-}day)^{-1}$	2.E-09
	1,2,3,7,8-PeCDD	3.60E-06	mg/kg	3.60E-06	mg/kg	M	9.25E-14	mg/kg-day	1.5E+05	$(mg/kg\text{-}day)^{-1}$	1.E-08
	1,2,3,4,7,8-HxCDD	5.10E-06	mg/kg	5.10E-06	mg/kg	M	1.31E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	2.E-09
	1,2,3,6,7,8-HxCDD	1.20E-05	mg/kg	1.20E-05	mg/kg	M	3.08E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	5.E-09
	1,2,3,7,8,9-HxCDD	1.00E-05	mg/kg	1.00E-05	mg/kg	M	2.57E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	4.E-09
	1,2,3,4,6,7,8-HpCDD	2.50E-04	mg/kg	2.50E-04	mg/kg	M	6.43E-12	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	1.E-08
	OCDD	2.00E-03	mg/kg	2.00E-03	mg/kg	M	5.14E-11	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	8.E-10
	2,3,7,8-TCDF	5.90E-05	mg/kg	5.90E-05	mg/kg	M	1.52E-12	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	2.E-08
	1,2,3,7,8-PeCDF	2.20E-05	mg/kg	2.20E-05	mg/kg	M	5.65E-13	mg/kg-day	7.5E+03	$(mg/kg\text{-}day)^{-1}$	4.E-09
	2,3,4,7,8-PeCDF	1.40E-04	mg/kg	1.40E-04	mg/kg	M	3.60E-12	mg/kg-day	7.5E+04	$(mg/kg\text{-}day)^{-1}$	3.E-07
	1,2,3,4,7,8-HxCDF	3.20E-05	mg/kg	3.20E-05	mg/kg	M	8.22E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	1.E-08
	1,2,3,6,7,8-HxCDF	1.90E-05	mg/kg	1.90E-05	mg/kg	M	4.88E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	7.E-09
	1,2,3,7,8,9-HxCDF	1.10E-05	mg/kg	1.10E-05	mg/kg	M	2.83E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	4.E-09
	2,3,4,6,7,8-HxCDF	2.10E-05	mg/kg	2.10E-05	mg/kg	M	5.40E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	8.E-09
	1,2,3,4,6,7,8-HpCDF	6.30E-05	mg/kg	6.30E-05	mg/kg	M	1.62E-12	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	2.E-09
	1,2,3,4,7,8,9-HpCDF	7.80E-06	mg/kg	7.80E-06	mg/kg	M	2.00E-13	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	3.E-10
	OCDF	1.00E-04	mg/kg	1.00E-04	mg/kg	M	2.57E-12	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	4.E-11
	Arsenic	7.00E+00	mg/kg	7.00E+00	mg/kg	M	1.80E-07	mg/kg-day	1.6E+00	$(mg/kg\text{-}day)^{-1}$	3.E-07
	Beryllium	3.60E-01	mg/kg	3.60E-01	mg/kg	M	3.08E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Cadmium (Food)	2.30E+01	mg/kg	2.30E+01	mg/kg	M	1.97E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Chromium VI (particulates)	5.30E+02	mg/kg	5.30E+02	mg/kg	M	4.54E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Lead	9.00E+02	mg/kg	9.00E+02	mg/kg	M	7.71E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Mercury	3.00E-01	mg/kg	3.00E-01	mg/kg	M	2.57E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	(Total)										2.E-04
										Total Risk Across Direct Exposure Routes/Pathways	2.E-02
										Total Risk Across All Exposure Routes/Pathways	4.E-02

(1) COPCs shown in this table are carcinogens classifed as known (A), probable (B1, B2), possible (C), or "known/likely" under new EPA Cancer Guidelines.
(2) M indicates the Medium EPC was used while R indicates the Route EPC was used.
(3) The Polychlorinated Biphenyls (PCBs) risk is from the total PCB concentration minus the concentration of dioxin-like congeners.
(4) The "Total Risk Across Direct Exposure Routes/Pathways" is the risk from the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.
The "Total Risk Across All Exposure Routes/Pathways" is the risk from the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.

TABLE 8.3.CT
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: 0 to 1 foot soil
Receptor Population: Resident
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (2)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (4)
Soil Ingestion	Tetrachloroethene	1.60E-01	mg/kg	1.60E-01	mg/kg	M	5.01E-09	mg/kg-day	5.2E-02	$(mg/kg\text{-}day)^{-1}$	3.E-10
	Naphthalene	7.10E-02	mg/kg	7.10E-02	mg/kg	M	2.22E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Benz(a)anthracene	3.70E+00	mg/kg	3.70E+00	mg/kg	M	1.16E-07	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	8.E-08
	Benzo(a)pyrene	4.70E-01	mg/kg	4.70E-01	mg/kg	M	1.47E-08	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	1.E-07
	Benzo(b)fluoranthene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	3.76E-08	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	3.E-08
	Benzo(k)fluoranthene	4.30E-01	mg/kg	4.30E-01	mg/kg	M	1.35E-08	mg/kg-day	7.3E-02	$(mg/kg\text{-}day)^{-1}$	1.E-09
	Chrysene	2.10E+00	mg/kg	2.10E+00	mg/kg	M	6.58E-08	mg/kg-day	7.3E-03	$(mg/kg\text{-}day)^{-1}$	5.E-10
	Dibenz(ah)anthracene	2.80E-01	mg/kg	2.80E-01	mg/kg	M	8.77E-09	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	6.E-08
	Indeno(123-cd)pyrene	6.60E-01	mg/kg	6.60E-01	mg/kg	M	2.07E-08	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	2.E-08
	bis(2-Ethylhexyl)phthalate	2.30E+01	mg/kg	2.30E+01	mg/kg	M	7.20E-07	mg/kg-day	1.4E-02	$(mg/kg\text{-}day)^{-1}$	1.E-08
	Polychlorinated Biphenyls (3)	3.70E+02	mg/kg	3.70E+02	mg/kg	M	1.16E-05	mg/kg-day	1.0E+00	$(mg/kg\text{-}day)^{-1}$	1.E-05
	PCB-77	7.30E-01	mg/kg	7.30E-01	mg/kg	M	2.29E-08	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	3.E-07
	PCB-81	3.30E-02	mg/kg	3.30E-02	mg/kg	M	1.03E-09	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-08
	PCB-105	1.00E+00	mg/kg	1.00E+00	mg/kg	M	3.13E-08	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	5.E-07
	PCB-114	1.00E-01	mg/kg	1.00E-01	mg/kg	M	3.13E-09	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-07
	PCB-118	1.70E+00	mg/kg	1.70E+00	mg/kg	M	5.32E-08	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	8.E-07
	PCB-123	1.80E-01	mg/kg	1.80E-01	mg/kg	M	5.64E-09	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	8.E-08
	PCB-126	8.00E-03	mg/kg	8.00E-03	mg/kg	M	2.50E-10	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	4.E-06
	PCB-156	5.80E-02	mg/kg	5.80E-02	mg/kg	M	1.82E-09	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	1.E-07
	PCB-157	1.30E-02	mg/kg	1.30E-02	mg/kg	M	4.07E-10	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	3.E-08
	PCB-167	1.10E-01	mg/kg	1.10E-01	mg/kg	M	3.44E-09	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	5.E-09
	PCB-189	8.30E-03	mg/kg	8.30E-03	mg/kg	M	2.60E-10	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	4.E-09
	2,3,7,8-TCDD	3.00E-07	mg/kg	3.00E-07	mg/kg	M	9.39E-15	mg/kg-day	1.5E+05	$(mg/kg\text{-}day)^{-1}$	1.E-09
	1,2,3,7,8-PeCDD	1.80E-06	mg/kg	1.80E-06	mg/kg	M	5.64E-14	mg/kg-day	1.5E+05	$(mg/kg\text{-}day)^{-1}$	8.E-09
	1,2,3,4,7,8-HxCDD	2.90E-06	mg/kg	2.90E-06	mg/kg	M	9.08E-14	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	1.E-09
	1,2,3,6,7,8-HxCDD	7.70E-06	mg/kg	7.70E-06	mg/kg	M	2.41E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	4.E-09
	1,2,3,7,8,9-HxCDD	5.70E-06	mg/kg	5.70E-06	mg/kg	M	1.78E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	3.E-09
	1,2,3,4,6,7,8-HpCDD	1.30E-04	mg/kg	1.30E-04	mg/kg	M	4.07E-12	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	6.E-09
	OCDD	1.00E-03	mg/kg	1.00E-03	mg/kg	M	3.13E-11	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	5.E-10
	2,3,7,8-TCDF	2.00E-05	mg/kg	2.00E-05	mg/kg	M	6.26E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	9.E-09
	1,2,3,7,8-PeCDF	7.70E-06	mg/kg	7.70E-06	mg/kg	M	2.41E-13	mg/kg-day	7.5E+03	$(mg/kg\text{-}day)^{-1}$	2.E-09
	2,3,4,7,8-PeCDF	5.50E-05	mg/kg	5.50E-05	mg/kg	M	1.72E-12	mg/kg-day	7.5E+04	$(mg/kg\text{-}day)^{-1}$	1.E-07
	1,2,3,4,7,8-HxCDF	1.50E-05	mg/kg	1.50E-05	mg/kg	M	4.70E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	7.E-09
	1,2,3,6,7,8-HxCDF	8.80E-06	mg/kg	8.80E-06	mg/kg	M	2.76E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	4.E-09
	1,2,3,7,8,9-HxCDF	4.30E-06	mg/kg	4.30E-06	mg/kg	M	1.35E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	2.E-09
	2,3,4,6,7,8-HxCDF	1.00E-05	mg/kg	1.00E-05	mg/kg	M	3.13E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	5.E-09
	1,2,3,4,6,7,8-HpCDF	3.40E-05	mg/kg	3.40E-05	mg/kg	M	1.06E-12	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	2.E-09
	1,2,3,4,7,8,9-HpCDF	3.80E-06	mg/kg	3.80E-06	mg/kg	M	1.19E-13	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	2.E-10
	OCDF	5.20E-05	mg/kg	5.20E-05	mg/kg	M	1.63E-12	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-11
	Arsenic	7.00E+00	mg/kg	7.00E+00	mg/kg	M	2.19E-07	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	3.E-07
	Beryllium	3.60E-01	mg/kg	3.60E-01	mg/kg	M	1.13E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Cadmium (Food)	1.10E+00	mg/kg	1.10E+00	mg/kg	M	3.44E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Chromium VI (particulates)	3.10E+01	mg/kg	3.10E+01	mg/kg	M	9.71E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Lead	9.00E+02	mg/kg	9.00E+02	mg/kg	M	2.82E-05	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Mercury	3.00E-01	mg/kg	3.00E-01	mg/kg	M	9.39E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	(Total)										2.E-05
										Total Risk Across Direct Exposure Routes/Pathways	1.E-04
										Total Risk Across All Exposure Routes/Pathways	2.E-04

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (2)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (4)
Soil	Tetrachloroethene	1.60E-01	mg/kg	1.60E-01	mg/kg	M	0.00E+00	mg/kg-day	5.2E-02	$(mg/kg\text{-}day)^{-1}$	---
Dermal	Naphthalene	7.10E-02	mg/kg	7.10E-02	mg/kg	M	2.53E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Benz(a)anthracene	3.70E+00	mg/kg	3.70E+00	mg/kg	M	1.72E-08	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	1.E-08
	Benzo(a)pyrene	4.70E-01	mg/kg	4.70E-01	mg/kg	M	2.18E-09	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	2.E-08
	Benzo(b)fluoranthene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	5.57E-09	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	4.E-09
	Benzo(k)fluoranthene	4.30E-01	mg/kg	4.30E-01	mg/kg	M	2.00E-09	mg/kg-day	7.3E-02	$(mg/kg\text{-}day)^{-1}$	1.E-10
	Chrysene	2.10E+00	mg/kg	2.10E+00	mg/kg	M	9.74E-09	mg/kg-day	7.3E-03	$(mg/kg\text{-}day)^{-1}$	7.E-11
	Dibenz(ah)anthracene	2.80E-01	mg/kg	2.80E-01	mg/kg	M	1.30E-09	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	9.E-09
	Indeno(123-cd)pyrene	6.60E-01	mg/kg	6.60E-01	mg/kg	M	3.06E-09	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	2.E-09
	bis(2-Ethylhexyl)phthalate	2.30E+01	mg/kg	2.30E+01	mg/kg	M	1.07E-07	mg/kg-day	2.5E-02	$(mg/kg\text{-}day)^{-1}$	1.E-09
	Polychlorinated Biphenyls (3)	3.70E+02	mg/kg	3.70E+02	mg/kg	M	1.85E-06	mg/kg-day	1.0E+00	$(mg/kg\text{-}day)^{-1}$	2.E-06
	PCB-77	7.30E-01	mg/kg	7.30E-01	mg/kg	M	3.65E-09	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	5.E-08
	PCB-81	3.30E-02	mg/kg	3.30E-02	mg/kg	M	1.65E-10	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-09
	PCB-105	1.00E+00	mg/kg	1.00E+00	mg/kg	M	5.00E-09	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	7.E-08
	PCB-114	1.00E-01	mg/kg	1.00E-01	mg/kg	M	5.00E-10	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	4.E-08
	PCB-118	1.70E+00	mg/kg	1.70E+00	mg/kg	M	8.50E-09	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	1.E-07
	PCB-123	1.80E-01	mg/kg	1.80E-01	mg/kg	M	9.00E-10	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	1.E-08
	PCB-126	8.00E-03	mg/kg	8.00E-03	mg/kg	M	4.00E-11	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	6.E-07
	PCB-156	5.80E-02	mg/kg	5.80E-02	mg/kg	M	2.90E-10	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-08
	PCB-157	1.30E-02	mg/kg	1.30E-02	mg/kg	M	6.50E-11	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	5.E-09
	PCB-167	1.10E-01	mg/kg	1.10E-01	mg/kg	M	5.50E-10	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	8.E-10
	PCB-189	8.30E-03	mg/kg	8.30E-03	mg/kg	M	4.15E-11	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	6.E-10
	2,3,7,8-TCDD	3.00E-07	mg/kg	3.00E-07	mg/kg	M	3.21E-16	mg/kg-day	1.5E+05	$(mg/kg\text{-}day)^{-1}$	5.E-11
	1,2,3,7,8-PeCDD	1.80E-06	mg/kg	1.80E-06	mg/kg	M	1.93E-15	mg/kg-day	1.5E+05	$(mg/kg\text{-}day)^{-1}$	3.E-10
	1,2,3,4,7,8-HxCDD	2.90E-06	mg/kg	2.90E-06	mg/kg	M	3.11E-15	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	5.E-11
	1,2,3,6,7,8-HxCDD	7.70E-06	mg/kg	7.70E-06	mg/kg	M	8.25E-15	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	1.E-10
	1,2,3,7,8,9-HxCDD	5.70E-06	mg/kg	5.70E-06	mg/kg	M	6.10E-15	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	9.E-11
	1,2,3,4,6,7,8-HpCDD	1.30E-04	mg/kg	1.30E-04	mg/kg	M	1.39E-13	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	2.E-10
	OCDD	1.00E-03	mg/kg	1.00E-03	mg/kg	M	1.07E-12	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-11
	2,3,7,8-TCDF	2.00E-05	mg/kg	2.00E-05	mg/kg	M	2.14E-14	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	3.E-10
	1,2,3,7,8-PeCDF	7.70E-06	mg/kg	7.70E-06	mg/kg	M	8.25E-15	mg/kg-day	7.5E+03	$(mg/kg\text{-}day)^{-1}$	6.E-11
	2,3,4,7,8-PeCDF	5.50E-05	mg/kg	5.50E-05	mg/kg	M	5.89E-14	mg/kg-day	7.5E+04	$(mg/kg\text{-}day)^{-1}$	4.E-09
	1,2,3,4,7,8-HxCDF	1.50E-05	mg/kg	1.50E-05	mg/kg	M	1.61E-14	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	2.E-10
	1,2,3,6,7,8-HxCDF	8.80E-06	mg/kg	8.80E-06	mg/kg	M	9.42E-15	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	1.E-10
	1,2,3,7,8,9-HxCDF	4.30E-06	mg/kg	4.30E-06	mg/kg	M	4.60E-15	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	7.E-11
	2,3,4,6,7,8-HxCDF	1.00E-05	mg/kg	1.00E-05	mg/kg	M	1.07E-14	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	2.E-10
	1,2,3,4,6,7,8-HpCDF	3.40E-05	mg/kg	3.40E-05	mg/kg	M	3.64E-14	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	5.E-11
	1,2,3,4,7,8,9-HpCDF	3.80E-06	mg/kg	3.80E-06	mg/kg	M	4.07E-15	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	6.E-12
	OCDF	5.20E-05	mg/kg	5.20E-05	mg/kg	M	5.57E-14	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	8.E-13
	Arsenic	7.00E+00	mg/kg	7.00E+00	mg/kg	M	7.50E-09	mg/kg-day	1.6E+00	$(mg/kg\text{-}day)^{-1}$	1.E-08
	Beryllium	3.60E-01	mg/kg	3.60E-01	mg/kg	M	1.29E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Cadmium (Food)	1.10E+00	mg/kg	1.10E+00	mg/kg	M	3.93E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Chromium VI (particulates)	3.10E+01	mg/kg	3.10E+01	mg/kg	M	1.11E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Lead	9.00E+02	mg/kg	9.00E+02	mg/kg	M	3.21E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Mercury	3.00E-01	mg/kg	3.00E-01	mg/kg	M	1.07E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	(Total)										3.E-06
										Total Risk Across Direct Exposure Routes/Pathways	1.E-04
										Total Risk Across All Exposure Routes/Pathways	2.E-04

(1) COPCs shown in this table are carcinogens classifed as known (A), probable (B1, B2), possible (C), or "known/likely" under new EPA Cancer Guidelines.
(2) M indicates the Medium EPC was used while R indicates the Route EPC was used.
(3) The Polychlorinated Biphenyls (PCBs) risk is from the total PCB concentration minus the concentration of dioxin-like congeners.
(4) The "Total Risk Across Direct Exposure Routes/Pathways" is the risk from the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.
The "Total Risk Across All Exposure Routes/Pathways" is the risk from the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.

TABLE 8.4.RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: 0 to 1 foot soil
Receptor Population: Resident
Receptor Age: Child

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (2)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (4)
Soil Ingestion	Tetrachloroethene	2.30E+00	mg/kg	2.30E+00	mg/kg	M	1.15E-06	mg/kg-day	5.2E-02	$(mg/kg\text{-}day)^{-1}$	6.E-08
	Naphthalene	5.90E-01	mg/kg	5.90E-01	mg/kg	M	2.96E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Benz(a)anthracene	3.70E+00	mg/kg	3.70E+00	mg/kg	M	1.85E-06	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	1.E-06
	Benzo(a)pyrene	2.00E+00	mg/kg	2.00E+00	mg/kg	M	1.00E-06	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	7.E-06
	Benzo(b)fluoranthene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	6.01E-07	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	4.E-07
	Benzo(k)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	8.52E-07	mg/kg-day	7.3E-02	$(mg/kg\text{-}day)^{-1}$	6.E-08
	Chrysene	2.10E+00	mg/kg	2.10E+00	mg/kg	M	1.05E-06	mg/kg-day	7.3E-03	$(mg/kg\text{-}day)^{-1}$	8.E-09
	Dibenz(ah)anthracene	2.80E-01	mg/kg	2.80E-01	mg/kg	M	1.40E-07	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	1.E-06
	Indeno(123-cd)pyrene	6.60E-01	mg/kg	6.60E-01	mg/kg	M	3.31E-07	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	2.E-07
	bis(2-Ethylhexyl)phthalate	1.30E+02	mg/kg	1.30E+02	mg/kg	M	6.51E-05	mg/kg-day	1.4E-02	$(mg/kg\text{-}day)^{-1}$	9.E-07
	Polychlorinated Biphenyls (3)	3.70E+02	mg/kg	3.70E+02	mg/kg	M	1.85E-04	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	4.E-04
	PCB-77	3.00E+00	mg/kg	3.00E+00	mg/kg	M	1.50E-06	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-05
	PCB-81	9.80E-02	mg/kg	9.80E-02	mg/kg	M	4.91E-08	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	7.E-07
	PCB-105	4.40E+00	mg/kg	4.40E+00	mg/kg	M	2.20E-06	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	3.E-05
	PCB-114	4.40E-01	mg/kg	4.40E-01	mg/kg	M	2.20E-07	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-05
	PCB-118	7.20E+00	mg/kg	7.20E+00	mg/kg	M	3.61E-06	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	5.E-05
	PCB-123	7.40E-01	mg/kg	7.40E-01	mg/kg	M	3.71E-07	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	6.E-06
	PCB-126	2.80E-02	mg/kg	2.80E-02	mg/kg	M	1.40E-08	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	2.E-04
	PCB-156	2.20E-01	mg/kg	2.20E-01	mg/kg	M	1.10E-07	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	8.E-06
	PCB-157	5.40E-02	mg/kg	5.40E-02	mg/kg	M	2.71E-08	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-06
	PCB-167	4.20E-01	mg/kg	4.20E-01	mg/kg	M	2.10E-07	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	3.E-07
	PCB-189	8.30E-03	mg/kg	8.30E-03	mg/kg	M	4.16E-09	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	6.E-08
	2,3,7,8-TCDD	3.90E-07	mg/kg	3.90E-07	mg/kg	M	1.95E-13	mg/kg-day	1.5E+05	$(mg/kg\text{-}day)^{-1}$	3.E-08
	1,2,3,7,8-PeCDD	3.60E-06	mg/kg	3.60E-06	mg/kg	M	1.80E-12	mg/kg-day	1.5E+05	$(mg/kg\text{-}day)^{-1}$	3.E-07
	1,2,3,4,7,8-HxCDD	5.10E-06	mg/kg	5.10E-06	mg/kg	M	2.55E-12	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	4.E-08
	1,2,3,6,7,8-HxCDD	1.20E-05	mg/kg	1.20E-05	mg/kg	M	6.01E-12	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	9.E-08
	1,2,3,7,8,9-HxCDD	1.00E-05	mg/kg	1.00E-05	mg/kg	M	5.01E-12	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	8.E-08
	1,2,3,4,6,7,8-HpCDD	2.50E-04	mg/kg	2.50E-04	mg/kg	M	1.25E-10	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	2.E-07
	OCDD	2.00E-03	mg/kg	2.00E-03	mg/kg	M	1.00E-09	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-08
	2,3,7,8-TCDF	5.90E-05	mg/kg	5.90E-05	mg/kg	M	2.96E-11	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	4.E-07
	1,2,3,7,8-PeCDF	2.20E-05	mg/kg	2.20E-05	mg/kg	M	1.10E-11	mg/kg-day	7.5E+03	$(mg/kg\text{-}day)^{-1}$	8.E-08
	2,3,4,7,8-PeCDF	1.40E-04	mg/kg	1.40E-04	mg/kg	M	7.01E-11	mg/kg-day	7.5E+04	$(mg/kg\text{-}day)^{-1}$	5.E-06
	1,2,3,4,7,8-HxCDF	3.20E-05	mg/kg	3.20E-05	mg/kg	M	1.60E-11	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	2.E-07
	1,2,3,6,7,8-HxCDF	1.90E-05	mg/kg	1.90E-05	mg/kg	M	9.52E-12	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	1.E-07
	1,2,3,7,8,9-HxCDF	1.10E-05	mg/kg	1.10E-05	mg/kg	M	5.51E-12	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	8.E-08
	2,3,4,6,7,8-HxCDF	2.10E-05	mg/kg	2.10E-05	mg/kg	M	1.05E-11	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	2.E-07
	1,2,3,4,6,7,8-HpCDF	6.30E-05	mg/kg	6.30E-05	mg/kg	M	3.16E-11	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	5.E-08
	1,2,3,4,7,8,9-HpCDF	7.80E-06	mg/kg	7.80E-06	mg/kg	M	3.91E-12	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	6.E-09
	OCDF	1.00E-04	mg/kg	1.00E-04	mg/kg	M	5.01E-11	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	8.E-10
	Arsenic	7.00E+00	mg/kg	7.00E+00	mg/kg	M	3.51E-06	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	5.E-06
	Beryllium	3.60E-01	mg/kg	3.60E-01	mg/kg	M	1.80E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Cadmium (Food)	2.30E+01	mg/kg	2.30E+01	mg/kg	M	1.15E-05	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Chromium VI (particulates)	5.30E+02	mg/kg	5.30E+02	mg/kg	M	2.66E-04	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Lead	9.00E+02	mg/kg	9.00E+02	mg/kg	M	4.51E-04	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Mercury	3.00E-01	mg/kg	3.00E-01	mg/kg	M	1.50E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	(Total)										7.E-04
										Total Risk Across Direct Exposure Routes/Pathways	2.E-02
										Total Risk Across All Exposure Routes/Pathways	3.E-02

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (2)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (4)
Soil	Tetrachloroethene	2.30E+00	mg/kg	2.30E+00	mg/kg	M	0.00E+00	mg/kg-day	5.2E-02	$(mg/kg\text{-}day)^{-1}$	---
Dermal	Naphthalene	5.90E-01	mg/kg	5.90E-01	mg/kg	M	8.57E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Benz(a)anthracene	3.70E+00	mg/kg	3.70E+00	mg/kg	M	6.99E-07	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	5.E-07
	Benzo(a)pyrene	2.00E+00	mg/kg	2.00E+00	mg/kg	M	3.78E-07	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	3.E-06
	Benzo(b)fluoranthene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	2.27E-07	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	2.E-07
	Benzo(k)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	3.21E-07	mg/kg-day	7.3E-02	$(mg/kg\text{-}day)^{-1}$	2.E-08
	Chrysene	2.10E+00	mg/kg	2.10E+00	mg/kg	M	3.97E-07	mg/kg-day	7.3E-03	$(mg/kg\text{-}day)^{-1}$	3.E-09
	Dibenz(ah)anthracene	2.80E-01	mg/kg	2.80E-01	mg/kg	M	5.29E-08	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	4.E-07
	Indeno(123-cd)pyrene	6.60E-01	mg/kg	6.60E-01	mg/kg	M	1.25E-07	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	9.E-08
	bis(2-Ethylhexyl)phthalate	1.30E+02	mg/kg	1.30E+02	mg/kg	M	2.46E-05	mg/kg-day	2.5E-02	$(mg/kg\text{-}day)^{-1}$	3.E-07
	Polychlorinated Biphenyls (3)	3.70E+02	mg/kg	3.70E+02	mg/kg	M	7.53E-05	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	2.E-04
	PCB-77	3.00E+00	mg/kg	3.00E+00	mg/kg	M	6.10E-07	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	9.E-06
	PCB-81	9.80E-02	mg/kg	9.80E-02	mg/kg	M	1.99E-08	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	3.E-07
	PCB-105	4.40E+00	mg/kg	4.40E+00	mg/kg	M	8.95E-07	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	1.E-05
	PCB-114	4.40E-01	mg/kg	4.40E-01	mg/kg	M	8.95E-08	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	7.E-06
	PCB-118	7.20E+00	mg/kg	7.20E+00	mg/kg	M	1.46E-06	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-05
	PCB-123	7.40E-01	mg/kg	7.40E-01	mg/kg	M	1.51E-07	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-06
	PCB-126	2.80E-02	mg/kg	2.80E-02	mg/kg	M	5.70E-09	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	9.E-05
	PCB-156	2.20E-01	mg/kg	2.20E-01	mg/kg	M	4.47E-08	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	3.E-06
	PCB-157	5.40E-02	mg/kg	5.40E-02	mg/kg	M	1.10E-08	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	8.E-07
	PCB-167	4.20E-01	mg/kg	4.20E-01	mg/kg	M	8.54E-08	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	1.E-07
	PCB-189	8.30E-03	mg/kg	8.30E-03	mg/kg	M	1.69E-09	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	3.E-08
	2,3,7,8-TCDD	3.90E-07	mg/kg	3.90E-07	mg/kg	M	1.70E-14	mg/kg-day	1.5E+05	$(mg/kg\text{-}day)^{-1}$	3.E-09
	1,2,3,7,8-PeCDD	3.60E-06	mg/kg	3.60E-06	mg/kg	M	1.57E-13	mg/kg-day	1.5E+05	$(mg/kg\text{-}day)^{-1}$	2.E-08
	1,2,3,4,7,8-HxCDD	5.10E-06	mg/kg	5.10E-06	mg/kg	M	2.22E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	3.E-09
	1,2,3,6,7,8-HxCDD	1.20E-05	mg/kg	1.20E-05	mg/kg	M	5.23E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	8.E-09
	1,2,3,7,8,9-HxCDD	1.00E-05	mg/kg	1.00E-05	mg/kg	M	4.36E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	7.E-09
	1,2,3,4,6,7,8-HpCDD	2.50E-04	mg/kg	2.50E-04	mg/kg	M	1.09E-11	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	2.E-08
	OCDD	2.00E-03	mg/kg	2.00E-03	mg/kg	M	8.72E-11	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	1.E-09
	2,3,7,8-TCDF	5.90E-05	mg/kg	5.90E-05	mg/kg	M	2.57E-12	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	4.E-08
	1,2,3,7,8-PeCDF	2.20E-05	mg/kg	2.20E-05	mg/kg	M	9.59E-13	mg/kg-day	7.5E+03	$(mg/kg\text{-}day)^{-1}$	7.E-09
	2,3,4,7,8-PeCDF	1.40E-04	mg/kg	1.40E-04	mg/kg	M	6.10E-12	mg/kg-day	7.5E+04	$(mg/kg\text{-}day)^{-1}$	5.E-07
	1,2,3,4,7,8-HxCDF	3.20E-05	mg/kg	3.20E-05	mg/kg	M	1.39E-12	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	2.E-08
	1,2,3,6,7,8-HxCDF	1.90E-05	mg/kg	1.90E-05	mg/kg	M	8.28E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	1.E-08
	1,2,3,7,8,9-HxCDF	1.10E-05	mg/kg	1.10E-05	mg/kg	M	4.79E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	7.E-09
	2,3,4,6,7,8-HxCDF	2.10E-05	mg/kg	2.10E-05	mg/kg	M	9.15E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	1.E-08
	1,2,3,4,6,7,8-HpCDF	6.30E-05	mg/kg	6.30E-05	mg/kg	M	2.75E-12	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	4.E-09
	1,2,3,4,7,8,9-HpCDF	7.80E-06	mg/kg	7.80E-06	mg/kg	M	3.40E-13	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	5.E-10
	OCDF	1.00E-04	mg/kg	1.00E-04	mg/kg	M	4.36E-12	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	7.E-11
	Arsenic	7.00E+00	mg/kg	7.00E+00	mg/kg	M	3.05E-07	mg/kg-day	1.6E+00	$(mg/kg\text{-}day)^{-1}$	5.E-07
	Beryllium	3.60E-01	mg/kg	3.60E-01	mg/kg	M	5.23E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Cadmium (Food)	2.30E+01	mg/kg	2.30E+01	mg/kg	M	3.34E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Chromium VI (particulates)	5.30E+02	mg/kg	5.30E+02	mg/kg	M	7.70E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Lead	9.00E+02	mg/kg	9.00E+02	mg/kg	M	1.31E-05	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Mercury	3.00E-01	mg/kg	3.00E-01	mg/kg	M	4.36E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	(Total)										3.E-04
										Total Risk Across Direct Exposure Routes/Pathways	2.E-02
										Total Risk Across All Exposure Routes/Pathways	3.E-02

(1) COPCs shown in this table are carcinogens classifed as known (A), probable (B1, B2), possible (C), or "known/likely" under new EPA Cancer Guidelines.
(2) M indicates the Medium EPC was used while R indicates the Route EPC was used.
(3) The Polychlorinated Biphenyls (PCBs) risk is from the total PCB concentration minus the concentration of dioxin-like congeners.
(4) The "Total Risk Across Direct Exposure Routes/Pathways" is the risk from the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.
The "Total Risk Across All Exposure Routes/Pathways" is the risk from the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.

TABLE 8.4.CT
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: 0 to 1 foot soil
Receptor Population: Resident
Receptor Age: Child

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (2)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (4)
Soil Ingestion	Tetrachloroethene	1.60E-01	mg/kg	1.60E-01	mg/kg	M	1.34E-08	mg/kg-day	5.2E-02	$(mg/kg\text{-}day)^{-1}$	7.E-10
	Naphthalene	7.10E-02	mg/kg	7.10E-02	mg/kg	M	5.93E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Benz(a)anthracene	3.70E+00	mg/kg	3.70E+00	mg/kg	M	3.09E-07	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	2.E-07
	Benzo(a)pyrene	4.70E-01	mg/kg	4.70E-01	mg/kg	M	3.92E-08	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	3.E-07
	Benzo(b)fluoranthene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	1.00E-07	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	7.E-08
	Benzo(k)fluoranthene	4.30E-01	mg/kg	4.30E-01	mg/kg	M	3.59E-08	mg/kg-day	7.3E-02	$(mg/kg\text{-}day)^{-1}$	3.E-09
	Chrysene	2.10E+00	mg/kg	2.10E+00	mg/kg	M	1.75E-07	mg/kg-day	7.3E-03	$(mg/kg\text{-}day)^{-1}$	1.E-09
	Dibenz(ah)anthracene	2.80E-01	mg/kg	2.80E-01	mg/kg	M	2.34E-08	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	2.E-07
	Indeno(123-cd)pyrene	6.60E-01	mg/kg	6.60E-01	mg/kg	M	5.51E-08	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	4.E-08
	bis(2-Ethylhexyl)phthalate	2.30E+01	mg/kg	2.30E+01	mg/kg	M	1.92E-06	mg/kg-day	1.4E-02	$(mg/kg\text{-}day)^{-1}$	3.E-08
	Polychlorinated Biphenyls (3)	3.70E+02	mg/kg	3.70E+02	mg/kg	M	3.09E-05	mg/kg-day	1.0E+00	$(mg/kg\text{-}day)^{-1}$	3.E-05
	PCB-77	7.30E-01	mg/kg	7.30E-01	mg/kg	M	6.10E-08	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	9.E-07
	PCB-81	3.30E-02	mg/kg	3.30E-02	mg/kg	M	2.76E-09	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	4.E-08
	PCB-105	1.00E+00	mg/kg	1.00E+00	mg/kg	M	8.35E-08	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	1.E-06
	PCB-114	1.00E-01	mg/kg	1.00E-01	mg/kg	M	8.35E-09	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	6.E-07
	PCB-118	1.70E+00	mg/kg	1.70E+00	mg/kg	M	1.42E-07	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-06
	PCB-123	1.80E-01	mg/kg	1.80E-01	mg/kg	M	1.50E-08	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-07
	PCB-126	8.00E-03	mg/kg	8.00E-03	mg/kg	M	6.68E-10	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	1.E-05
	PCB-156	5.80E-02	mg/kg	5.80E-02	mg/kg	M	4.84E-09	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	4.E-07
	PCB-157	1.30E-02	mg/kg	1.30E-02	mg/kg	M	1.09E-09	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	8.E-08
	PCB-167	1.10E-01	mg/kg	1.10E-01	mg/kg	M	9.18E-09	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	1.E-08
	PCB-189	8.30E-03	mg/kg	8.30E-03	mg/kg	M	6.93E-10	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	1.E-08
	2,3,7,8-TCDD	3.00E-07	mg/kg	3.00E-07	mg/kg	M	2.50E-14	mg/kg-day	1.5E+05	$(mg/kg\text{-}day)^{-1}$	4.E-09
	1,2,3,7,8-PeCDD	1.80E-06	mg/kg	1.80E-06	mg/kg	M	1.50E-13	mg/kg-day	1.5E+05	$(mg/kg\text{-}day)^{-1}$	2.E-08
	1,2,3,4,7,8-HxCDD	2.90E-06	mg/kg	2.90E-06	mg/kg	M	2.42E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	4.E-09
	1,2,3,6,7,8-HxCDD	7.70E-06	mg/kg	7.70E-06	mg/kg	M	6.43E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	1.E-08
	1,2,3,7,8,9-HxCDD	5.70E-06	mg/kg	5.70E-06	mg/kg	M	4.76E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	7.E-09
	1,2,3,4,6,7,8-HpCDD	1.30E-04	mg/kg	1.30E-04	mg/kg	M	1.09E-11	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	2.E-08
	OCDD	1.00E-03	mg/kg	1.00E-03	mg/kg	M	8.35E-11	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	1.E-09
	2,3,7,8-TCDF	2.00E-05	mg/kg	2.00E-05	mg/kg	M	1.67E-12	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	3.E-08
	1,2,3,7,8-PeCDF	7.70E-06	mg/kg	7.70E-06	mg/kg	M	6.43E-13	mg/kg-day	7.5E+03	$(mg/kg\text{-}day)^{-1}$	5.E-09
	2,3,4,7,8-PeCDF	5.50E-05	mg/kg	5.50E-05	mg/kg	M	4.59E-12	mg/kg-day	7.5E+04	$(mg/kg\text{-}day)^{-1}$	3.E-07
	1,2,3,4,7,8-HxCDF	1.50E-05	mg/kg	1.50E-05	mg/kg	M	1.25E-12	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	2.E-08
	1,2,3,6,7,8-HxCDF	8.80E-06	mg/kg	8.80E-06	mg/kg	M	7.35E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	1.E-08
	1,2,3,7,8,9-HxCDF	4.30E-06	mg/kg	4.30E-06	mg/kg	M	3.59E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	5.E-09
	2,3,4,6,7,8-HxCDF	1.00E-05	mg/kg	1.00E-05	mg/kg	M	8.35E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	1.E-08
	1,2,3,4,6,7,8-HpCDF	3.40E-05	mg/kg	3.40E-05	mg/kg	M	2.84E-12	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	4.E-09
	1,2,3,4,7,8,9-HpCDF	3.80E-06	mg/kg	3.80E-06	mg/kg	M	3.17E-13	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	5.E-10
	OCDF	5.20E-05	mg/kg	5.20E-05	mg/kg	M	4.34E-12	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	7.E-11
	Arsenic	7.00E+00	mg/kg	7.00E+00	mg/kg	M	5.84E-07	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	9.E-07
	Beryllium	3.60E-01	mg/kg	3.60E-01	mg/kg	M	3.01E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Cadmium (Food)	1.10E+00	mg/kg	1.10E+00	mg/kg	M	9.18E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Chromium VI (particulates)	3.10E+01	mg/kg	3.10E+01	mg/kg	M	2.59E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Lead	9.00E+02	mg/kg	9.00E+02	mg/kg	M	7.51E-05	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Mercury	3.00E-01	mg/kg	3.00E-01	mg/kg	M	2.50E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	(Total)										5.E-05
										Total Risk Across Direct Exposure Routes/Pathways	2.E-04
										Total Risk Across All Exposure Routes/Pathways	2.E-04

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (2)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (4)
Soil	Tetrachloroethene	1.60E-01	mg/kg	1.60E-01	mg/kg	M	0.00E+00	mg/kg-day	5.2E-02	$(mg/kg\text{-}day)^{-1}$	---
Dermal	Naphthalene	7.10E-02	mg/kg	7.10E-02	mg/kg	M	1.03E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Benz(a)anthracene	3.70E+00	mg/kg	3.70E+00	mg/kg	M	6.99E-08	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	5.E-08
	Benzo(a)pyrene	4.70E-01	mg/kg	4.70E-01	mg/kg	M	8.88E-09	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	6.E-08
	Benzo(b)fluoranthene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	2.27E-08	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	2.E-08
	Benzo(k)fluoranthene	4.30E-01	mg/kg	4.30E-01	mg/kg	M	8.12E-09	mg/kg-day	7.3E-02	$(mg/kg\text{-}day)^{-1}$	6.E-10
	Chrysene	2.10E+00	mg/kg	2.10E+00	mg/kg	M	3.97E-08	mg/kg-day	7.3E-03	$(mg/kg\text{-}day)^{-1}$	3.E-10
	Dibenz(ah)anthracene	2.80E-01	mg/kg	2.80E-01	mg/kg	M	5.29E-09	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	4.E-08
	Indeno(123-cd)pyrene	6.60E-01	mg/kg	6.60E-01	mg/kg	M	1.25E-08	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	9.E-09
	bis(2-Ethylhexyl)phthalate	2.30E+01	mg/kg	2.30E+01	mg/kg	M	4.34E-07	mg/kg-day	2.5E-02	$(mg/kg\text{-}day)^{-1}$	6.E-09
	Polychlorinated Biphenyls (3)	3.70E+02	mg/kg	3.70E+02	mg/kg	M	7.53E-06	mg/kg-day	1.0E+00	$(mg/kg\text{-}day)^{-1}$	8.E-06
	PCB-77	7.30E-01	mg/kg	7.30E-01	mg/kg	M	1.48E-08	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-07
	PCB-81	3.30E-02	mg/kg	3.30E-02	mg/kg	M	6.71E-10	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	1.E-08
	PCB-105	1.00E+00	mg/kg	1.00E+00	mg/kg	M	2.03E-08	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	3.E-07
	PCB-114	1.00E-01	mg/kg	1.00E-01	mg/kg	M	2.03E-09	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-07
	PCB-118	1.70E+00	mg/kg	1.70E+00	mg/kg	M	3.46E-08	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	5.E-07
	PCB-123	1.80E-01	mg/kg	1.80E-01	mg/kg	M	3.66E-09	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	5.E-08
	PCB-126	8.00E-03	mg/kg	8.00E-03	mg/kg	M	1.63E-10	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	2.E-06
	PCB-156	5.80E-02	mg/kg	5.80E-02	mg/kg	M	1.18E-09	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	9.E-08
	PCB-157	1.30E-02	mg/kg	1.30E-02	mg/kg	M	2.64E-10	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-08
	PCB-167	1.10E-01	mg/kg	1.10E-01	mg/kg	M	2.24E-09	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	3.E-09
	PCB-189	8.30E-03	mg/kg	8.30E-03	mg/kg	M	1.69E-10	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	3.E-09
	2,3,7,8-TCDD	3.00E-07	mg/kg	3.00E-07	mg/kg	M	1.31E-15	mg/kg-day	1.5E+05	$(mg/kg\text{-}day)^{-1}$	2.E-10
	1,2,3,7,8-PeCDD	1.80E-06	mg/kg	1.80E-06	mg/kg	M	7.85E-15	mg/kg-day	1.5E+05	$(mg/kg\text{-}day)^{-1}$	1.E-09
	1,2,3,4,7,8-HxCDD	2.90E-06	mg/kg	2.90E-06	mg/kg	M	1.26E-14	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	2.E-10
	1,2,3,6,7,8-HxCDD	7.70E-06	mg/kg	7.70E-06	mg/kg	M	3.36E-14	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	5.E-10
	1,2,3,7,8,9-HxCDD	5.70E-06	mg/kg	5.70E-06	mg/kg	M	2.48E-14	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	4.E-10
	1,2,3,4,6,7,8-HpCDD	1.30E-04	mg/kg	1.30E-04	mg/kg	M	5.67E-13	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	8.E-10
	OCDD	1.00E-03	mg/kg	1.00E-03	mg/kg	M	4.36E-12	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	7.E-11
	2,3,7,8-TCDF	2.00E-05	mg/kg	2.00E-05	mg/kg	M	8.72E-14	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	1.E-09
	1,2,3,7,8-PeCDF	7.70E-06	mg/kg	7.70E-06	mg/kg	M	3.36E-14	mg/kg-day	7.5E+03	$(mg/kg\text{-}day)^{-1}$	3.E-10
	2,3,4,7,8-PeCDF	5.50E-05	mg/kg	5.50E-05	mg/kg	M	2.40E-13	mg/kg-day	7.5E+04	$(mg/kg\text{-}day)^{-1}$	2.E-08
	1,2,3,4,7,8-HxCDF	1.50E-05	mg/kg	1.50E-05	mg/kg	M	6.54E-14	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	1.E-09
	1,2,3,6,7,8-HxCDF	8.80E-06	mg/kg	8.80E-06	mg/kg	M	3.84E-14	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	6.E-10
	1,2,3,7,8,9-HxCDF	4.30E-06	mg/kg	4.30E-06	mg/kg	M	1.87E-14	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	3.E-10
	2,3,4,6,7,8-HxCDF	1.00E-05	mg/kg	1.00E-05	mg/kg	M	4.36E-14	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	7.E-10
	1,2,3,4,6,7,8-HpCDF	3.40E-05	mg/kg	3.40E-05	mg/kg	M	1.48E-13	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	2.E-10
	1,2,3,4,7,8,9-HpCDF	3.80E-06	mg/kg	3.80E-06	mg/kg	M	1.66E-14	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	2.E-11
	OCDF	5.20E-05	mg/kg	5.20E-05	mg/kg	M	2.27E-13	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	3.E-12
	Arsenic	7.00E+00	mg/kg	7.00E+00	mg/kg	M	3.05E-08	mg/kg-day	1.6E+00	$(mg/kg\text{-}day)^{-1}$	5.E-08
	Beryllium	3.60E-01	mg/kg	3.60E-01	mg/kg	M	5.23E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Cadmium (Food)	1.10E+00	mg/kg	1.10E+00	mg/kg	M	1.60E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Chromium VI (particulates)	3.10E+01	mg/kg	3.10E+01	mg/kg	M	4.50E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Lead	9.00E+02	mg/kg	9.00E+02	mg/kg	M	1.31E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Mercury	3.00E-01	mg/kg	3.00E-01	mg/kg	M	4.36E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	(Total)										1.E-05
										Total Risk Across Direct Exposure Routes/Pathways	2.E-04
										Total Risk Across All Exposure Routes/Pathways	2.E-04

(1) COPCs shown in this table are carcinogens classifed as known (A), probable (B1, B2), possible (C), or "known/likely" under new EPA Cancer Guidelines.
(2) M indicates the Medium EPC was used while R indicates the Route EPC was used.
(3) The Polychlorinated Biphenyls (PCBs) risk is from the total PCB concentration minus the concentration of dioxin-like congeners.
(4) The "Total Risk Across Direct Exposure Routes/Pathways" is the risk from the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.
The "Total Risk Across All Exposure Routes/Pathways" is the risk from the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.

TABLE 8.5.RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Tap Water
Receptor Population: Resident
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (2)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (3)
Drinking Water Ingestion	Benzene	2.40E-01	mg/L	2.40E-01	mg/L	M	2.25E-03	mg/kg-day	2.9E-02	$(mg/kg\text{-}day)^{-1}$	7.E-05
	Chloromethane	5.00E-03	mg/L	5.00E-03	mg/L	M	4.70E-05	mg/kg-day	1.3E-02	$(mg/kg\text{-}day)^{-1}$	6.E-07
	1,1-Dichloroethane	1.10E+00	mg/L	1.10E+00	mg/L	M	1.03E-02	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	1,2-Dichloroethane	1.80E-02	mg/L	1.80E-02	mg/L	M	1.69E-04	mg/kg-day	9.1E-02	$(mg/kg\text{-}day)^{-1}$	2.E-05
	1,1-Dichloroethene	1.20E-02	mg/L	1.20E-02	mg/L	M	1.13E-04	mg/kg-day	6.0E-01	$(mg/kg\text{-}day)^{-1}$	7.E-05
	Methylene Chloride	1.90E+00	mg/L	1.90E+00	mg/L	M	1.78E-02	mg/kg-day	7.5E-03	$(mg/kg\text{-}day)^{-1}$	1.E-04
	1,1,2,2-Tetrachloroethane	1.90E-03	mg/L	1.90E-03	mg/L	M	1.78E-05	mg/kg-day	2.0E-01	$(mg/kg\text{-}day)^{-1}$	4.E-06
	Tetrachloroethene	2.50E-02	mg/L	2.50E-02	mg/L	M	2.35E-04	mg/kg-day	5.2E-02	$(mg/kg\text{-}day)^{-1}$	1.E-05
	Trichloroethene	8.80E-01	mg/L	8.80E-01	mg/L	M	8.27E-03	mg/kg-day	1.1E-02	$(mg/kg\text{-}day)^{-1}$	9.E-05
	Vinyl Chloride	7.30E-01	mg/L	7.30E-01	mg/L	M	6.86E-03	mg/kg-day	2.5E+00	$(mg/kg\text{-}day)^{-1}$	2.E-02
	Naphthalene	2.10E-01	mg/L	2.10E-01	mg/L	M	1.97E-03	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Aldrin	4.70E-05	mg/L	4.70E-05	mg/L	M	4.41E-07	mg/kg-day	1.7E+01	$(mg/kg\text{-}day)^{-1}$	8.E-06
	alpha-BHC	2.60E-05	mg/L	2.60E-05	mg/L	M	2.44E-07	mg/kg-day	6.3E+00	$(mg/kg\text{-}day)^{-1}$	2.E-06
	gamma-BHC (Lindane)	7.60E-05	mg/L	7.60E-05	mg/L	M	7.14E-07	mg/kg-day	1.3E+00	$(mg/kg\text{-}day)^{-1}$	9.E-07
	Dieldrin	4.70E-05	mg/L	4.70E-05	mg/L	M	4.41E-07	mg/kg-day	1.6E+01	$(mg/kg\text{-}day)^{-1}$	7.E-06
	Heptachlor	4.10E-05	mg/L	4.10E-05	mg/L	M	3.85E-07	mg/kg-day	4.5E+00	$(mg/kg\text{-}day)^{-1}$	2.E-06
	Heptachlor Epoxide	2.00E-05	mg/L	2.00E-05	mg/L	M	1.88E-07	mg/kg-day	9.1E+00	$(mg/kg\text{-}day)^{-1}$	2.E-06
	Arsenic	2.80E-02	mg/L	2.80E-02	mg/L	M	2.63E-04	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	4.E-04
	Cadmium (Water)	8.00E-03	mg/L	8.00E-03	mg/L	M	7.51E-05	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Chromium VI (aerosols)	6.40E-02	mg/L	6.40E-02	mg/L	M	6.01E-04	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	(Total)										2.E-02
										Total Risk Across Direct Exposure Routes/Pathways	2.E-02
										Total Risk Across All Exposure Routes/Pathways	4.E-02

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (2)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (3)
Drinking Water Dermal	Benzene	2.40E-01	mg/L	2.40E-01	mg/L	M	2.25E-03	mg/kg-day	2.9E-02	$(mg/kg\text{-}day)^{-1}$	7.E-05
	Chloromethane	5.00E-03	mg/L	5.00E-03	mg/L	M	1.79E-06	mg/kg-day	1.3E-02	$(mg/kg\text{-}day)^{-1}$	2.E-08
	1,1-Dichloroethane	1.10E+00	mg/L	1.10E+00	mg/L	M	8.35E-04	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	1,2-Dichloroethane	1.80E-02	mg/L	1.80E-02	mg/L	M	8.13E-06	mg/kg-day	9.1E-02	$(mg/kg\text{-}day)^{-1}$	7.E-07
	1,1-Dichloroethene	1.20E-02	mg/L	1.20E-02	mg/L	M	1.64E-05	mg/kg-day	6.0E-01	$(mg/kg\text{-}day)^{-1}$	1.E-05
	Methylene Chloride	1.90E+00	mg/L	1.90E+00	mg/L	M	7.29E-04	mg/kg-day	7.5E-03	$(mg/kg\text{-}day)^{-1}$	5.E-06
	1,1,2,2-Tetrachloroethane	1.90E-03	mg/L	1.90E-03	mg/L	M	1.46E-06	mg/kg-day	2.0E-01	$(mg/kg\text{-}day)^{-1}$	3.E-07
	Tetrachloroethene	2.50E-02	mg/L	2.50E-02	mg/L	M	7.89E-04	mg/kg-day	5.2E-02	$(mg/kg\text{-}day)^{-1}$	4.E-05
	Trichloroethene	8.80E-01	mg/L	8.80E-01	mg/L	M	1.73E-02	mg/kg-day	1.1E-02	$(mg/kg\text{-}day)^{-1}$	2.E-04
	Vinyl Chloride	7.30E-01	mg/L	7.30E-01	mg/L	M	4.54E-04	mg/kg-day	2.5E+00	$(mg/kg\text{-}day)^{-1}$	1.E-03
	Naphthalene	2.10E-01	mg/L	2.10E-01	mg/L	M	1.24E-03	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Aldrin	4.70E-05	mg/L	4.70E-05	mg/L	M	6.41E-09	mg/kg-day	1.7E+01	$(mg/kg\text{-}day)^{-1}$	1.E-07
	alpha-BHC	2.60E-05	mg/L	2.60E-05	mg/L	M	4.65E-07	mg/kg-day	6.3E+00	$(mg/kg\text{-}day)^{-1}$	3.E-06
	gamma-BHC (Lindane)	7.60E-05	mg/L	7.60E-05	mg/L	M	1.36E-06	mg/kg-day	1.3E+00	$(mg/kg\text{-}day)^{-1}$	2.E-06
	Dieldrin	4.70E-05	mg/L	4.70E-05	mg/L	M	6.41E-08	mg/kg-day	1.6E+01	$(mg/kg\text{-}day)^{-1}$	1.E-06
	Heptachlor	4.10E-05	mg/L	4.10E-05	mg/L	M	3.84E-08	mg/kg-day	4.5E+00	$(mg/kg\text{-}day)^{-1}$	2.E-07
	Heptachlor Epoxide	2.00E-05	mg/L	2.00E-05	mg/L	M	1.88E-08	mg/kg-day	9.1E+00	$(mg/kg\text{-}day)^{-1}$	2.E-07
	Arsenic	2.80E-02	mg/L	2.80E-02	mg/L	M	2.39E-06	mg/kg-day	1.6E+00	$(mg/kg\text{-}day)^{-1}$	4.E-06
	Cadmium (Water)	8.00E-03	mg/L	8.00E-03	mg/L	M	6.82E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Chromium VI (aerosols)	6.40E-02	mg/L	6.40E-02	mg/L	M	1.09E-05	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	(Total)										1.E-03
										Total Risk Across Direct Exposure Routes/Pathways	2.E-02
										Total Risk Across All Exposure Routes/Pathways	4.E-02

(1) COPCs shown in this table are carcinogens classifed as known (A), probable (B1, B2), possible (C), or "known/likely" under new EPA Cancer Guidelines.
(2) M indicates the Medium EPC was used while R indicates the Route EPC was used.
(3) The "Total Risk Across Direct Exposure Routes/Pathways" is the risk from the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.
The "Total Risk Across All Exposure Routes/Pathways" is the risk from the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.
Both Total Risk cells show the risk for an adult resident exposed to groundwater and 0 to 1 foot soil. The risk shown is greater than or equal to
the risk from groundwater and 0 to 10 foot soil exposure.

TABLE 8.5.CT
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Tap Water
Receptor Population: Resident
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (2)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (3)
Drinking Water Ingestion	Benzene	1.10E-02	mg/L	1.10E-02	mg/L	M	2.11E-05	mg/kg-day	2.9E-02	$(mg/kg\text{-}day)^{-1}$	6.E-07
	Chloromethane	1.50E-03	mg/L	1.50E-03	mg/L	M	2.88E-06	mg/kg-day	1.3E-02	$(mg/kg\text{-}day)^{-1}$	4.E-08
	1,1-Dichloroethane	2.80E-02	mg/L	2.80E-02	mg/L	M	5.37E-05	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	1,2-Dichloroethane	2.00E-03	mg/L	2.00E-03	mg/L	M	3.84E-06	mg/kg-day	9.1E-02	$(mg/kg\text{-}day)^{-1}$	3.E-07
	1,1-Dichloroethene	1.70E-03	mg/L	1.70E-03	mg/L	M	3.26E-06	mg/kg-day	6.0E-01	$(mg/kg\text{-}day)^{-1}$	2.E-06
	Methylene Chloride	2.60E-02	mg/L	2.60E-02	mg/L	M	4.99E-05	mg/kg-day	7.5E-03	$(mg/kg\text{-}day)^{-1}$	4.E-07
	1,1,2,2-Tetrachloroethane	1.50E-03	mg/L	1.50E-03	mg/L	M	2.88E-06	mg/kg-day	2.0E-01	$(mg/kg\text{-}day)^{-1}$	6.E-07
	Tetrachloroethene	3.40E-03	mg/L	3.40E-03	mg/L	M	6.52E-06	mg/kg-day	5.2E-02	$(mg/kg\text{-}day)^{-1}$	3.E-07
	Trichloroethene	2.20E-02	mg/L	2.20E-02	mg/L	M	4.22E-05	mg/kg-day	1.1E-02	$(mg/kg\text{-}day)^{-1}$	5.E-07
	Vinyl Chloride	1.70E-02	mg/L	1.70E-02	mg/L	M	3.26E-05	mg/kg-day	2.5E+00	$(mg/kg\text{-}day)^{-1}$	8.E-05
	Naphthalene	1.80E-02	mg/L	1.80E-02	mg/L	M	3.45E-05	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Aldrin	1.50E-05	mg/L	1.50E-05	mg/L	M	2.88E-08	mg/kg-day	1.7E+01	$(mg/kg\text{-}day)^{-1}$	5.E-07
	alpha-BHC	7.10E-06	mg/L	7.10E-06	mg/L	M	1.36E-08	mg/kg-day	6.3E+00	$(mg/kg\text{-}day)^{-1}$	9.E-08
	gamma-BHC (Lindane)	1.60E-05	mg/L	1.60E-05	mg/L	M	3.07E-08	mg/kg-day	1.3E+00	$(mg/kg\text{-}day)^{-1}$	4.E-08
	Dieldrin	1.20E-05	mg/L	1.20E-05	mg/L	M	2.30E-08	mg/kg-day	1.6E+01	$(mg/kg\text{-}day)^{-1}$	4.E-07
	Heptachlor	9.40E-06	mg/L	9.40E-06	mg/L	M	1.80E-08	mg/kg-day	4.5E+00	$(mg/kg\text{-}day)^{-1}$	8.E-08
	Heptachlor Epoxide	6.10E-06	mg/L	6.10E-06	mg/L	M	1.17E-08	mg/kg-day	9.1E+00	$(mg/kg\text{-}day)^{-1}$	1.E-07
	Arsenic	1.10E-02	mg/L	1.10E-02	mg/L	M	2.11E-05	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	3.E-05
	Cadmium (Water)	6.10E-04	mg/L	6.10E-04	mg/L	M	1.17E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Chromium VI (aerosols)	1.20E-02	mg/L	1.20E-02	mg/L	M	2.30E-05	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	(Total)										1.E-04
										Total Risk Across Direct Exposure Routes/Pathways	1.E-04
										Total Risk Across All Exposure Routes/Pathways	2.E-04

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (2)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (3)
Drinking	Benzene	1.10E-02	mg/L	1.10E-02	mg/L	M	9.93E-06	mg/kg-day	2.9E-02	$(mg/kg\text{-}day)^{-1}$	3.E-07
Water	Chloromethane	1.50E-03	mg/L	1.50E-03	mg/L	M	5.17E-08	mg/kg-day	1.3E-02	$(mg/kg\text{-}day)^{-1}$	7.E-10
Dermal	1,1-Dichloroethane	2.80E-02	mg/L	2.80E-02	mg/L	M	2.04E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	1,2-Dichloroethane	2.00E-03	mg/L	2.00E-03	mg/L	M	8.70E-08	mg/kg-day	9.1E-02	$(mg/kg\text{-}day)^{-1}$	8.E-09
	1,1-Dichloroethene	1.70E-03	mg/L	1.70E-03	mg/L	M	2.23E-07	mg/kg-day	6.0E-01	$(mg/kg\text{-}day)^{-1}$	1.E-07
	Methylene Chloride	2.60E-02	mg/L	2.60E-02	mg/L	M	9.60E-07	mg/kg-day	7.5E-03	$(mg/kg\text{-}day)^{-1}$	7.E-09
	1,1,2,2-Tetrachloroethane	1.50E-03	mg/L	1.50E-03	mg/L	M	1.11E-07	mg/kg-day	2.0E-01	$(mg/kg\text{-}day)^{-1}$	2.E-08
	Tetrachloroethene	3.40E-03	mg/L	3.40E-03	mg/L	M	1.03E-05	mg/kg-day	5.2E-02	$(mg/kg\text{-}day)^{-1}$	5.E-07
	Trichloroethene	2.20E-02	mg/L	2.20E-02	mg/L	M	4.15E-05	mg/kg-day	1.1E-02	$(mg/kg\text{-}day)^{-1}$	5.E-07
	Vinyl Chloride	1.70E-02	mg/L	1.70E-02	mg/L	M	1.02E-06	mg/kg-day	2.5E+00	$(mg/kg\text{-}day)^{-1}$	3.E-06
	Naphthalene	1.80E-02	mg/L	1.80E-02	mg/L	M	1.02E-05	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Aldrin	1.50E-05	mg/L	1.50E-05	mg/L	M	1.97E-10	mg/kg-day	1.7E+01	$(mg/kg\text{-}day)^{-1}$	3.E-09
	alpha-BHC	7.10E-06	mg/L	7.10E-06	mg/L	M	1.22E-08	mg/kg-day	6.3E+00	$(mg/kg\text{-}day)^{-1}$	8.E-08
	gamma-BHC (Lindane)	1.60E-05	mg/L	1.60E-05	mg/L	M	2.76E-08	mg/kg-day	1.3E+00	$(mg/kg\text{-}day)^{-1}$	4.E-08
	Dieldrin	1.20E-05	mg/L	1.20E-05	mg/L	M	1.58E-09	mg/kg-day	1.6E+01	$(mg/kg\text{-}day)^{-1}$	3.E-08
	Heptachlor	9.40E-06	mg/L	9.40E-06	mg/L	M	8.48E-10	mg/kg-day	4.5E+00	$(mg/kg\text{-}day)^{-1}$	4.E-09
	Heptachlor Epoxide	6.10E-06	mg/L	6.10E-06	mg/L	M	5.51E-10	mg/kg-day	9.1E+00	$(mg/kg\text{-}day)^{-1}$	5.E-09
	Arsenic	1.10E-02	mg/L	1.10E-02	mg/L	M	9.03E-08	mg/kg-day	1.6E+00	$(mg/kg\text{-}day)^{-1}$	1.E-07
	Cadmium (Water)	6.10E-04	mg/L	6.10E-04	mg/L	M	5.00E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Chromium VI (aerosols)	1.20E-02	mg/L	1.20E-02	mg/L	M	1.97E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	(Total)										4.E-06
										Total Risk Across Direct Exposure Routes/Pathways	1.E-04
										Total Risk Across All Exposure Routes/Pathways	2.E-04

(1) COPCs shown in this table are carcinogens classifed as known (A), probable (B1, B2), possible (C), or "known/likely" under new EPA Cancer Guidelines.
(2) M indicates the Medium EPC was used while R indicates the Route EPC was used.
(3) The "Total Risk Across Direct Exposure Routes/Pathways" is the risk from the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.
The "Total Risk Across All Exposure Routes/Pathways" is the risk from the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.
Both Total Risk cells show the risk for an adult resident exposed to groundwater and 0 to 1 foot soil. The risk shown is greater than or equal to
the risk from groundwater and 0 to 10 foot soil exposure.

TABLE 8.6.RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Tap Water
Receptor Population: Resident
Receptor Age: Child

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (2)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (3)
Drinking Water Ingestion	Benzene	2.40E-01	mg/L	2.40E-01	mg/L	M	1.97E-03	mg/kg-day	2.9E-02	$(mg/kg\text{-}day)^{-1}$	6.E-05
	Chloromethane	5.00E-03	mg/L	5.00E-03	mg/L	M	4.11E-05	mg/kg-day	1.3E-02	$(mg/kg\text{-}day)^{-1}$	5.E-07
	1,1-Dichloroethane	1.10E+00	mg/L	1.10E+00	mg/L	M	9.04E-03	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	1,2-Dichloroethane	1.80E-02	mg/L	1.80E-02	mg/L	M	1.48E-04	mg/kg-day	9.1E-02	$(mg/kg\text{-}day)^{-1}$	1.E-05
	1,1-Dichloroethene	1.20E-02	mg/L	1.20E-02	mg/L	M	9.86E-05	mg/kg-day	6.0E-01	$(mg/kg\text{-}day)^{-1}$	6.E-05
	Methylene Chloride	1.90E+00	mg/L	1.90E+00	mg/L	M	1.56E-02	mg/kg-day	7.5E-03	$(mg/kg\text{-}day)^{-1}$	1.E-04
	1,1,2,2-Tetrachloroethane	1.90E-03	mg/L	1.90E-03	mg/L	M	1.56E-05	mg/kg-day	2.0E-01	$(mg/kg\text{-}day)^{-1}$	3.E-06
	Tetrachloroethene	2.50E-02	mg/L	2.50E-02	mg/L	M	2.05E-04	mg/kg-day	5.2E-02	$(mg/kg\text{-}day)^{-1}$	1.E-05
	Trichloroethene	8.80E-01	mg/L	8.80E-01	mg/L	M	7.23E-03	mg/kg-day	1.1E-02	$(mg/kg\text{-}day)^{-1}$	8.E-05
	Vinyl Chloride	7.30E-01	mg/L	7.30E-01	mg/L	M	6.00E-03	mg/kg-day	2.5E+00	$(mg/kg\text{-}day)^{-1}$	2.E-02
	Naphthalene	2.10E-01	mg/L	2.10E-01	mg/L	M	1.73E-03	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Aldrin	4.70E-05	mg/L	4.70E-05	mg/L	M	3.86E-07	mg/kg-day	1.7E+01	$(mg/kg\text{-}day)^{-1}$	7.E-06
	alpha-BHC	2.60E-05	mg/L	2.60E-05	mg/L	M	2.14E-07	mg/kg-day	6.3E+00	$(mg/kg\text{-}day)^{-1}$	1.E-06
	gamma-BHC (Lindane)	7.60E-05	mg/L	7.60E-05	mg/L	M	6.25E-07	mg/kg-day	1.3E+00	$(mg/kg\text{-}day)^{-1}$	8.E-07
	Dieldrin	4.70E-05	mg/L	4.70E-05	mg/L	M	3.86E-07	mg/kg-day	1.6E+01	$(mg/kg\text{-}day)^{-1}$	6.E-06
	Heptachlor	4.10E-05	mg/L	4.10E-05	mg/L	M	3.37E-07	mg/kg-day	4.5E+00	$(mg/kg\text{-}day)^{-1}$	2.E-06
	Heptachlor Epoxide	2.00E-05	mg/L	2.00E-05	mg/L	M	1.64E-07	mg/kg-day	9.1E+00	$(mg/kg\text{-}day)^{-1}$	1.E-06
	Arsenic	2.80E-02	mg/L	2.80E-02	mg/L	M	2.30E-04	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	3.E-04
	Cadmium (Water)	8.00E-03	mg/L	8.00E-03	mg/L	M	6.58E-05	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Chromium VI (aerosols)	6.40E-02	mg/L	6.40E-02	mg/L	M	5.26E-04	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	(Total)										2.E-02
										Total Risk Across Direct Exposure Routes/Pathways	2.E-02
										Total Risk Across All Exposure Routes/Pathways	3.E-02

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (2)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (3)
Drinking Water Dermal	Benzene	2.40E-01	mg/L	2.40E-01	mg/L	M	9.95E-04	mg/kg-day	2.9E-02	$(mg/kg\text{-}day)^{-1}$	3.E-05
	Chloromethane	5.00E-03	mg/L	5.00E-03	mg/L	M	7.92E-07	mg/kg-day	1.3E-02	$(mg/kg\text{-}day)^{-1}$	1.E-08
	1,1-Dichloroethane	1.10E+00	mg/L	1.10E+00	mg/L	M	3.69E-04	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	1,2-Dichloroethane	1.80E-02	mg/L	1.80E-02	mg/L	M	3.60E-06	mg/kg-day	9.1E-02	$(mg/kg\text{-}day)^{-1}$	3.E-07
	1,1-Dichloroethene	1.20E-02	mg/L	1.20E-02	mg/L	M	7.24E-06	mg/kg-day	6.0E-01	$(mg/kg\text{-}day)^{-1}$	4.E-06
	Methylene Chloride	1.90E+00	mg/L	1.90E+00	mg/L	M	3.22E-04	mg/kg-day	7.5E-03	$(mg/kg\text{-}day)^{-1}$	2.E-06
	1,1,2,2-Tetrachloroethane	1.90E-03	mg/L	1.90E-03	mg/L	M	6.45E-07	mg/kg-day	2.0E-01	$(mg/kg\text{-}day)^{-1}$	1.E-07
	Tetrachloroethene	2.50E-02	mg/L	2.50E-02	mg/L	M	3.49E-04	mg/kg-day	5.2E-02	$(mg/kg\text{-}day)^{-1}$	2.E-05
	Trichloroethene	8.80E-01	mg/L	8.80E-01	mg/L	M	7.63E-03	mg/kg-day	1.1E-02	$(mg/kg\text{-}day)^{-1}$	8.E-05
	Vinyl Chloride	7.30E-01	mg/L	7.30E-01	mg/L	M	2.01E-04	mg/kg-day	2.5E+00	$(mg/kg\text{-}day)^{-1}$	5.E-04
	Naphthalene	2.10E-01	mg/L	2.10E-01	mg/L	M	5.46E-04	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Aldrin	4.70E-05	mg/L	4.70E-05	mg/L	M	2.83E-09	mg/kg-day	1.7E+01	$(mg/kg\text{-}day)^{-1}$	5.E-08
	alpha-BHC	2.60E-05	mg/L	2.60E-05	mg/L	M	2.06E-07	mg/kg-day	6.3E+00	$(mg/kg\text{-}day)^{-1}$	1.E-06
	gamma-BHC (Lindane)	7.60E-05	mg/L	7.60E-05	mg/L	M	6.02E-07	mg/kg-day	1.3E+00	$(mg/kg\text{-}day)^{-1}$	8.E-07
	Dieldrin	4.70E-05	mg/L	4.70E-05	mg/L	M	2.83E-08	mg/kg-day	1.6E+01	$(mg/kg\text{-}day)^{-1}$	5.E-07
	Heptachlor	4.10E-05	mg/L	4.10E-05	mg/L	M	1.70E-08	mg/kg-day	4.5E+00	$(mg/kg\text{-}day)^{-1}$	8.E-08
	Heptachlor Epoxide	2.00E-05	mg/L	2.00E-05	mg/L	M	8.29E-09	mg/kg-day	9.1E+00	$(mg/kg\text{-}day)^{-1}$	8.E-08
	Arsenic	2.80E-02	mg/L	2.80E-02	mg/L	M	1.06E-06	mg/kg-day	1.6E+00	$(mg/kg\text{-}day)^{-1}$	2.E-06
	Cadmium (Water)	8.00E-03	mg/L	8.00E-03	mg/L	M	3.02E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Chromium VI (aerosols)	6.40E-02	mg/L	6.40E-02	mg/L	M	4.83E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	(Total)										6.E-04
										Total Risk Across Direct Exposure Routes/Pathways	2.E-02
										Total Risk Across All Exposure Routes/Pathways	3.E-02

(1) COPCs shown in this table are carcinogens classifed as known (A), probable (B1, B2), possible (C), or "known/likely" under new EPA Cancer Guidelines.
(2) M indicates the Medium EPC was used while R indicates the Route EPC was used.
(3) The "Total Risk Across Direct Exposure Routes/Pathways" is the risk from the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.
The "Total Risk Across All Exposure Routes/Pathways" is the risk from the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.
Both Total Risk cells show the risk for an adult resident exposed to groundwater and 0 to 1 foot soil. The risk shown is greater than or equal to
the risk from groundwater and 0 to 10 foot soil exposure.

TABLE 8.6.CT
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Tap Water
Receptor Population: Resident
Receptor Age: Child

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (2)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (3)
Drinking Water Ingestion	Benzene	1.10E-02	mg/L	1.10E-02	mg/L	M	1.75E-05	mg/kg-day	2.9E-02	$(mg/kg\text{-}day)^{-1}$	5.E-07
	Chloromethane	1.50E-03	mg/L	1.50E-03	mg/L	M	2.38E-06	mg/kg-day	1.3E-02	$(mg/kg\text{-}day)^{-1}$	3.E-08
	1,1-Dichloroethane	2.80E-02	mg/L	2.80E-02	mg/L	M	4.45E-05	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	1,2-Dichloroethane	2.00E-03	mg/L	2.00E-03	mg/L	M	3.18E-06	mg/kg-day	9.1E-02	$(mg/kg\text{-}day)^{-1}$	3.E-07
	1,1-Dichloroethene	1.70E-03	mg/L	1.70E-03	mg/L	M	2.70E-06	mg/kg-day	6.0E-01	$(mg/kg\text{-}day)^{-1}$	2.E-06
	Methylene Chloride	2.60E-02	mg/L	2.60E-02	mg/L	M	4.13E-05	mg/kg-day	7.5E-03	$(mg/kg\text{-}day)^{-1}$	3.E-07
	1,1,2,2-Tetrachloroethane	1.50E-03	mg/L	1.50E-03	mg/L	M	2.38E-06	mg/kg-day	2.0E-01	$(mg/kg\text{-}day)^{-1}$	5.E-07
	Tetrachloroethene	3.40E-03	mg/L	3.40E-03	mg/L	M	5.40E-06	mg/kg-day	5.2E-02	$(mg/kg\text{-}day)^{-1}$	3.E-07
	Trichloroethene	2.20E-02	mg/L	2.20E-02	mg/L	M	3.50E-05	mg/kg-day	1.1E-02	$(mg/kg\text{-}day)^{-1}$	4.E-07
	Vinyl Chloride	1.70E-02	mg/L	1.70E-02	mg/L	M	2.70E-05	mg/kg-day	2.5E+00	$(mg/kg\text{-}day)^{-1}$	7.E-05
	Naphthalene	1.80E-02	mg/L	1.80E-02	mg/L	M	2.86E-05	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Aldrin	1.50E-05	mg/L	1.50E-05	mg/L	M	2.38E-08	mg/kg-day	1.7E+01	$(mg/kg\text{-}day)^{-1}$	4.E-07
	alpha-BHC	7.10E-06	mg/L	7.10E-06	mg/L	M	1.13E-08	mg/kg-day	6.3E+00	$(mg/kg\text{-}day)^{-1}$	7.E-08
	gamma-BHC (Lindane)	1.60E-05	mg/L	1.60E-05	mg/L	M	2.54E-08	mg/kg-day	1.3E+00	$(mg/kg\text{-}day)^{-1}$	3.E-08
	Dieldrin	1.20E-05	mg/L	1.20E-05	mg/L	M	1.91E-08	mg/kg-day	1.6E+01	$(mg/kg\text{-}day)^{-1}$	3.E-07
	Heptachlor	9.40E-06	mg/L	9.40E-06	mg/L	M	1.49E-08	mg/kg-day	4.5E+00	$(mg/kg\text{-}day)^{-1}$	7.E-08
	Heptachlor Epoxide	6.10E-06	mg/L	6.10E-06	mg/L	M	9.69E-09	mg/kg-day	9.1E+00	$(mg/kg\text{-}day)^{-1}$	9.E-08
	Arsenic	1.10E-02	mg/L	1.10E-02	mg/L	M	1.75E-05	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	3.E-05
	Cadmium (Water)	6.10E-04	mg/L	6.10E-04	mg/L	M	9.69E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Chromium VI (aerosols)	1.20E-02	mg/L	1.20E-02	mg/L	M	1.91E-05	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	(Total)										1.E-04
										Total Risk Across Direct Exposure Routes/Pathways	2.E-04
										Total Risk Across All Exposure Routes/Pathways	2.E-04

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (2)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (3)
Drinking Water Dermal	Benzene	1.10E-02	mg/L	1.10E-02	mg/L	M	5.02E-06	mg/kg-day	2.9E-02	$(mg/kg\text{-}day)^{-1}$	1.E-07
	Chloromethane	1.50E-03	mg/L	1.50E-03	mg/L	M	2.61E-08	mg/kg-day	1.3E-02	$(mg/kg\text{-}day)^{-1}$	3.E-10
	1,1-Dichloroethane	2.80E-02	mg/L	2.80E-02	mg/L	M	1.03E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	1,2-Dichloroethane	2.00E-03	mg/L	2.00E-03	mg/L	M	4.40E-08	mg/kg-day	9.1E-02	$(mg/kg\text{-}day)^{-1}$	4.E-09
	1,1-Dichloroethene	1.70E-03	mg/L	1.70E-03	mg/L	M	1.13E-07	mg/kg-day	6.0E-01	$(mg/kg\text{-}day)^{-1}$	7.E-08
	Methylene Chloride	2.60E-02	mg/L	2.60E-02	mg/L	M	4.85E-07	mg/kg-day	7.5E-03	$(mg/kg\text{-}day)^{-1}$	4.E-09
	1,1,2,2-Tetrachloroethane	1.50E-03	mg/L	1.50E-03	mg/L	M	5.60E-08	mg/kg-day	2.0E-01	$(mg/kg\text{-}day)^{-1}$	1.E-08
	Tetrachloroethene	3.40E-03	mg/L	3.40E-03	mg/L	M	5.22E-06	mg/kg-day	5.2E-02	$(mg/kg\text{-}day)^{-1}$	3.E-07
	Trichloroethene	2.20E-02	mg/L	2.20E-02	mg/L	M	2.10E-05	mg/kg-day	1.1E-02	$(mg/kg\text{-}day)^{-1}$	2.E-07
	Vinyl Chloride	1.70E-02	mg/L	1.70E-02	mg/L	M	5.15E-07	mg/kg-day	2.5E+00	$(mg/kg\text{-}day)^{-1}$	1.E-06
	Naphthalene	1.80E-02	mg/L	1.80E-02	mg/L	M	5.15E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Aldrin	1.50E-05	mg/L	1.50E-05	mg/L	M	9.95E-11	mg/kg-day	1.7E+01	$(mg/kg\text{-}day)^{-1}$	2.E-09
	alpha-BHC	7.10E-06	mg/L	7.10E-06	mg/L	M	6.18E-09	mg/kg-day	6.3E+00	$(mg/kg\text{-}day)^{-1}$	4.E-08
	gamma-BHC (Lindane)	1.60E-05	mg/L	1.60E-05	mg/L	M	1.39E-08	mg/kg-day	1.3E+00	$(mg/kg\text{-}day)^{-1}$	2.E-08
	Dieldrin	1.20E-05	mg/L	1.20E-05	mg/L	M	7.96E-10	mg/kg-day	1.6E+01	$(mg/kg\text{-}day)^{-1}$	1.E-08
	Heptachlor	9.40E-06	mg/L	9.40E-06	mg/L	M	4.29E-10	mg/kg-day	4.5E+00	$(mg/kg\text{-}day)^{-1}$	2.E-09
	Heptachlor Epoxide	6.10E-06	mg/L	6.10E-06	mg/L	M	2.78E-10	mg/kg-day	9.1E+00	$(mg/kg\text{-}day)^{-1}$	3.E-09
	Arsenic	1.10E-02	mg/L	1.10E-02	mg/L	M	4.56E-08	mg/kg-day	1.6E+00	$(mg/kg\text{-}day)^{-1}$	7.E-08
	Cadmium (Water)	6.10E-04	mg/L	6.10E-04	mg/L	M	2.53E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Chromium VI (aerosols)	1.20E-02	mg/L	1.20E-02	mg/L	M	9.95E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	(Total)										2.E-06
										Total Risk Across Direct Exposure Routes/Pathways	2.E-04
										Total Risk Across All Exposure Routes/Pathways	2.E-04

(1) COPCs shown in this table are carcinogens classifed as known (A), probable (B1, B2), possible (C), or "known/likely" under new EPA Cancer Guidelines.
(2) M indicates the Medium EPC was used while R indicates the Route EPC was used.
(3) The "Total Risk Across Direct Exposure Routes/Pathways" is the risk from the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.
The "Total Risk Across All Exposure Routes/Pathways" is the risk from the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.
Both Total Risk cells show the risk for an adult resident exposed to groundwater and 0 to 1 foot soil. The risk shown is greater than or equal to
the risk from groundwater and 0 to 10 foot soil exposure.

TABLE 8.7.RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Tap Water
Receptor Population: Resident
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (2)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (3)
Drinking Water Ingestion	Benzene	5.20E-04	mg/L	5.20E-04	mg/L	M	4.88E-06	mg/kg-day	2.9E-02	$(mg/kg\text{-}day)^{-1}$	1.E-07
	1,2-Dichloroethane	1.10E-03	mg/L	1.10E-03	mg/L	M	1.03E-05	mg/kg-day	9.1E-02	$(mg/kg\text{-}day)^{-1}$	9.E-07
	Trichloroethene	4.10E-03	mg/L	4.10E-03	mg/L	M	3.85E-05	mg/kg-day	1.1E-02	$(mg/kg\text{-}day)^{-1}$	4.E-07
	Vinyl Chloride	2.10E-03	mg/L	2.10E-03	mg/L	M	1.97E-05	mg/kg-day	2.5E+00	$(mg/kg\text{-}day)^{-1}$	5.E-05
	Heptachlor	1.70E-06	mg/L	1.70E-06	mg/L	M	1.60E-08	mg/kg-day	4.5E+00	$(mg/kg\text{-}day)^{-1}$	7.E-08
	(Total)										5.E-05
Drinking Water Dermal	Benzene	5.20E-04	mg/L	5.20E-04	mg/L	M	4.88E-06	mg/kg-day	2.9E-02	$(mg/kg\text{-}day)^{-1}$	1.E-07
	1,2-Dichloroethane	1.10E-03	mg/L	1.10E-03	mg/L	M	4.97E-07	mg/kg-day	9.1E-02	$(mg/kg\text{-}day)^{-1}$	5.E-08
	Trichloroethene	4.10E-03	mg/L	4.10E-03	mg/L	M	8.04E-05	mg/kg-day	1.1E-02	$(mg/kg\text{-}day)^{-1}$	9.E-07
	Vinyl Chloride	2.10E-03	mg/L	2.10E-03	mg/L	M	1.31E-06	mg/kg-day	2.5E+00	$(mg/kg\text{-}day)^{-1}$	3.E-06
	Heptachlor	1.70E-06	mg/L	1.70E-06	mg/L	M	1.59E-09	mg/kg-day	4.5E+00	$(mg/kg\text{-}day)^{-1}$	7.E-09
	(Total)										4.E-06
										Total Risk Across Direct Exposure Routes/Pathways	6.E-05
										Total Risk Across All Exposure Routes/Pathways	1.E-04

(1) COPCs shown in this table are carcinogens classifed as known (A), probable (B1, B2), possible (C), or "known/likely" under new EPA Cancer Guidelines.
(2) M indicates the Medium EPC was used while R indicates the Route EPC was used.
(3) The "Total Risk Across Direct Exposure Routes/Pathways" is the risk from the groundwater ingestion and groundwater dermal contact exposure pathways.
The "Total Risk Across All Exposure Routes/Pathways" is the risk from the direct exposure pathways plus the groundwater vapor inhalation pathway.

TABLE 8.7.CT
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Tap Water
Receptor Population: Resident
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (2)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (3)
Drinking Water Ingestion	Benzene	3.90E-04	mg/L	3.90E-04	mg/L	M	7.48E-07	mg/kg-day	2.9E-02	$(mg/kg\text{-}day)^{-1}$	2.E-08
	1,2-Dichloroethane	6.50E-04	mg/L	6.50E-04	mg/L	M	1.25E-06	mg/kg-day	9.1E-02	$(mg/kg\text{-}day)^{-1}$	1.E-07
	Trichloroethene	2.60E-03	mg/L	2.60E-03	mg/L	M	4.99E-06	mg/kg-day	1.1E-02	$(mg/kg\text{-}day)^{-1}$	5.E-08
	Vinyl Chloride	1.20E-03	mg/L	1.20E-03	mg/L	M	2.30E-06	mg/kg-day	2.5E+00	$(mg/kg\text{-}day)^{-1}$	6.E-06
	Heptachlor	1.50E-06	mg/L	1.50E-06	mg/L	M	2.88E-09	mg/kg-day	4.5E+00	$(mg/kg\text{-}day)^{-1}$	1.E-08
	(Total)										6.E-06
Drinking Water Dermal	Benzene	3.90E-04	mg/L	3.90E-04	mg/L	M	3.52E-07	mg/kg-day	2.9E-02	$(mg/kg\text{-}day)^{-1}$	1.E-08
	1,2-Dichloroethane	6.50E-04	mg/L	6.50E-04	mg/L	M	2.83E-08	mg/kg-day	9.1E-02	$(mg/kg\text{-}day)^{-1}$	3.E-09
	Trichloroethene	2.60E-03	mg/L	2.60E-03	mg/L	M	4.91E-06	mg/kg-day	1.1E-02	$(mg/kg\text{-}day)^{-1}$	5.E-08
	Vinyl Chloride	1.20E-03	mg/L	1.20E-03	mg/L	M	7.19E-08	mg/kg-day	2.5E+00	$(mg/kg\text{-}day)^{-1}$	2.E-07
	Heptachlor	1.50E-06	mg/L	1.50E-06	mg/L	M	1.35E-10	mg/kg-day	4.5E+00	$(mg/kg\text{-}day)^{-1}$	6.E-10
	(Total)										2.E-07
										Total Risk Across Direct Exposure Routes/Pathways	6.E-06
										Total Risk Across All Exposure Routes/Pathways	1.E-05

(1) COPCs shown in this table are carcinogens classifed as known (A), probable (B1, B2), possible (C), or "known/likely" under new EPA Cancer Guidelines.
(2) M indicates the Medium EPC was used while R indicates the Route EPC was used.
(3) The "Total Risk Across Direct Exposure Routes/Pathways" is the risk from the groundwater ingestion and groundwater dermal contact exposure pathways.
The "Total Risk Across All Exposure Routes/Pathways" is the risk from the direct exposure pathways plus the groundwater vapor inhalation pathway.

TABLE 8.8.RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Tap Water
Receptor Population: Resident
Receptor Age: Child

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (2)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (3)
Drinking Water Ingestion	Benzene	5.20E-04	mg/L	5.20E-04	mg/L	M	4.27E-06	mg/kg-day	2.9E-02	$(mg/kg\text{-}day)^{-1}$	1.E-07
	1,2-Dichloroethane	1.10E-03	mg/L	1.10E-03	mg/L	M	9.04E-06	mg/kg-day	9.1E-02	$(mg/kg\text{-}day)^{-1}$	8.E-07
	Trichloroethene	4.10E-03	mg/L	4.10E-03	mg/L	M	3.37E-05	mg/kg-day	1.1E-02	$(mg/kg\text{-}day)^{-1}$	4.E-07
	Vinyl Chloride	2.10E-03	mg/L	2.10E-03	mg/L	M	1.73E-05	mg/kg-day	2.5E+00	$(mg/kg\text{-}day)^{-1}$	4.E-05
	Heptachlor	1.70E-06	mg/L	1.70E-06	mg/L	M	1.40E-08	mg/kg-day	4.5E+00	$(mg/kg\text{-}day)^{-1}$	6.E-08
	(Total)										4.E-05
Drinking Water Dermal	Benzene	5.20E-04	mg/L	5.20E-04	mg/L	M	2.16E-06	mg/kg-day	2.9E-02	$(mg/kg\text{-}day)^{-1}$	6.E-08
	1,2-Dichloroethane	1.10E-03	mg/L	1.10E-03	mg/L	M	2.20E-07	mg/kg-day	9.1E-02	$(mg/kg\text{-}day)^{-1}$	2.E-08
	Trichloroethene	4.10E-03	mg/L	4.10E-03	mg/L	M	3.55E-05	mg/kg-day	1.1E-02	$(mg/kg\text{-}day)^{-1}$	4.E-07
	Vinyl Chloride	2.10E-03	mg/L	2.10E-03	mg/L	M	5.78E-07	mg/kg-day	2.5E+00	$(mg/kg\text{-}day)^{-1}$	1.E-06
	Heptachlor	1.70E-06	mg/L	1.70E-06	mg/L	M	7.05E-10	mg/kg-day	4.5E+00	$(mg/kg\text{-}day)^{-1}$	3.E-09
	(Total)										2.E-06
										Total Risk Across Direct Exposure Routes/Pathways	5.E-05
										Total Risk Across All Exposure Routes/Pathways	9.E-05

(1) COPCs shown in this table are carcinogens classifed as known (A), probable (B1, B2), possible (C), or "known/likely" under new EPA Cancer Guidelines.
(2) M indicates the Medium EPC was used while R indicates the Route EPC was used.

TABLE 8.8.CT
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Tap Water
Receptor Population: Resident
Receptor Age: Child

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (2)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (3)
Drinking Water Ingestion	Benzene	3.90E-04	mg/L	3.90E-04	mg/L	M	6.20E-07	mg/kg-day	2.9E-02	$(mg/kg\text{-}day)^{-1}$	2.E-08
	1,2-Dichloroethane	6.50E-04	mg/L	6.50E-04	mg/L	M	1.03E-06	mg/kg-day	9.1E-02	$(mg/kg\text{-}day)^{-1}$	9.E-08
	Trichloroethene	2.60E-03	mg/L	2.60E-03	mg/L	M	4.13E-06	mg/kg-day	1.1E-02	$(mg/kg\text{-}day)^{-1}$	5.E-08
	Vinyl Chloride	1.20E-03	mg/L	1.20E-03	mg/L	M	1.91E-06	mg/kg-day	2.5E+00	$(mg/kg\text{-}day)^{-1}$	5.E-06
	Heptachlor	1.50E-06	mg/L	1.50E-06	mg/L	M	2.38E-09	mg/kg-day	4.5E+00	$(mg/kg\text{-}day)^{-1}$	1.E-08
	(Total)										5.E-06
Drinking Water Dermal	Benzene	3.90E-04	mg/L	3.90E-04	mg/L	M	1.78E-07	mg/kg-day	2.9E-02	$(mg/kg\text{-}day)^{-1}$	5.E-09
	1,2-Dichloroethane	6.50E-04	mg/L	6.50E-04	mg/L	M	1.43E-08	mg/kg-day	9.1E-02	$(mg/kg\text{-}day)^{-1}$	1.E-09
	Trichloroethene	2.60E-03	mg/L	2.60E-03	mg/L	M	2.48E-06	mg/kg-day	1.1E-02	$(mg/kg\text{-}day)^{-1}$	3.E-08
	Vinyl Chloride	1.20E-03	mg/L	1.20E-03	mg/L	M	3.63E-08	mg/kg-day	2.5E+00	$(mg/kg\text{-}day)^{-1}$	9.E-08
	Heptachlor	1.50E-06	mg/L	1.50E-06	mg/L	M	6.84E-11	mg/kg-day	4.5E+00	$(mg/kg\text{-}day)^{-1}$	3.E-10
	(Total)										1.E-07
										Total Risk Across Direct Exposure Routes/Pathways	5.E-06
										Total Risk Across All Exposure Routes/Pathways	1.E-05

(1) COPCs shown in this table are carcinogens classifed as known (A), probable (B1, B2), possible (C), or "known/likely" under new EPA Cancer Guidelines.
(2) M indicates the Medium EPC was used while R indicates the Route EPC was used.

TABLE 8.9.RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Kelley Brook and adjacent wetlands
Receptor Population: Fisherperson
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (2)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (3)
Surface Water Ingestion	Vinyl Chloride	3.00E-03	mg/L	3.00E-03	mg/L	M	1.29E-07	mg/kg-day	2.5E+00	$(mg/kg\text{-}day)^{-1}$	3.E-07
	Benz(a)anthracene	3.90E-04	mg/L	3.90E-04	mg/L	M	1.67E-08	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	1.E-08
	Benzo(a)pyrene	4.40E-04	mg/L	4.40E-04	mg/L	M	1.89E-08	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	1.E-07
	Benzo(b)fluoranthene	4.10E-04	mg/L	4.10E-04	mg/L	M	1.76E-08	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	1.E-08
	Benzo(k)fluoranthene	3.50E-04	mg/L	3.50E-04	mg/L	M	1.50E-08	mg/kg-day	7.3E-02	$(mg/kg\text{-}day)^{-1}$	1.E-09
	Chrysene	4.20E-04	mg/L	4.20E-04	mg/L	M	1.80E-08	mg/kg-day	7.3E-03	$(mg/kg\text{-}day)^{-1}$	1.E-10
	Dibenz(ah)anthracene	6.10E-05	mg/L	6.10E-05	mg/L	M	2.62E-09	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	2.E-08
	Indeno(123-cd)pyrene	4.20E-04	mg/L	4.20E-04	mg/L	M	1.80E-08	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	1.E-08
	Heptachlor Epoxide	1.70E-06	mg/L	1.70E-06	mg/L	M	7.30E-11	mg/kg-day	9.1E+00	$(mg/kg\text{-}day)^{-1}$	7.E-10
	Arsenic	3.80E-03	mg/L	3.80E-03	mg/L	M	1.63E-07	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	2.E-07
	(Total)										8.E-07
Surface Water Dermal	Vinyl Chloride	3.00E-03	mg/L	3.00E-03	mg/L	M	3.92E-07	mg/kg-day	2.5E+00	$(mg/kg\text{-}day)^{-1}$	1.E-06
	Benz(a)anthracene	3.90E-04	mg/L	3.90E-04	mg/L	M	5.66E-06	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	4.E-06
	Benzo(a)pyrene	4.40E-04	mg/L	4.40E-04	mg/L	M	9.46E-06	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	7.E-05
	Benzo(b)fluoranthene	4.10E-04	mg/L	4.10E-04	mg/L	M	8.82E-06	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	6.E-06
	Benzo(k)fluoranthene	3.50E-04	mg/L	3.50E-04	mg/L	M	7.53E-06	mg/kg-day	7.3E-02	$(mg/kg\text{-}day)^{-1}$	5.E-07
	Chrysene	4.20E-04	mg/L	4.20E-04	mg/L	M	6.10E-06	mg/kg-day	7.3E-03	$(mg/kg\text{-}day)^{-1}$	4.E-08
	Dibenz(ah)anthracene	6.10E-05	mg/L	6.10E-05	mg/L	M	2.95E-06	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	2.E-05
	Indeno(123-cd)pyrene	4.20E-04	mg/L	4.20E-04	mg/L	M	1.43E-05	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	1.E-05
	Heptachlor Epoxide	1.70E-06	mg/L	1.70E-06	mg/L	M	3.35E-10	mg/kg-day	9.1E+00	$(mg/kg\text{-}day)^{-1}$	3.E-09
	Arsenic	3.80E-03	mg/L	3.80E-03	mg/L	M	6.81E-08	mg/kg-day	1.6E+00	$(mg/kg\text{-}day)^{-1}$	1.E-07
	(Total)										1.E-04
										Total Risk Across All Exposure Routes/Pathways	2.E-04

(1) COPCs shown in this table are carcinogens classifed as known (A), probable (B1, B2), possible (C), or "known/likely" under new EPA Cancer Guidelines.
(2) M indicates the Medium EPC was used while R indicates the Route EPC was used.
(3) The "Total Risk Across All Exposure Routes/Pathways" is the sum of the risk from the following exposure pathways: surface water ingestion and dermal contact, sediment ingestion and dermal contact, and fish ingestion.

TABLE 8.9.CT
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Kelley Brook and adjacent wetlands
Receptor Population: Fisherperson
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (2)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (3)
Surface Water Ingestion	Vinyl Chloride	1.30E-03	mg/L	1.30E-03	mg/L	M	5.60E-09	mg/kg-day	2.5E+00	$(mg/kg\text{-}day)^{-1}$	1.E-08
	Benz(a)anthracene	6.00E-05	mg/L	6.00E-05	mg/L	M	2.58E-10	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	2.E-10
	Benzo(a)pyrene	6.70E-05	mg/L	6.70E-05	mg/L	M	2.88E-10	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	2.E-09
	Benzo(b)fluoranthene	6.30E-05	mg/L	6.30E-05	mg/L	M	2.71E-10	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	2.E-10
	Benzo(k)fluoranthene	5.50E-05	mg/L	5.50E-05	mg/L	M	2.37E-10	mg/kg-day	7.3E-02	$(mg/kg\text{-}day)^{-1}$	2.E-11
	Chrysene	6.50E-05	mg/L	6.50E-05	mg/L	M	2.80E-10	mg/kg-day	7.3E-03	$(mg/kg\text{-}day)^{-1}$	2.E-12
	Dibenz(ah)anthracene	1.20E-05	mg/L	1.20E-05	mg/L	M	5.17E-11	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	4.E-10
	Indeno(123-cd)pyrene	6.50E-05	mg/L	6.50E-05	mg/L	M	2.80E-10	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	2.E-10
	Heptachlor Epoxide	9.60E-07	mg/L	9.60E-07	mg/L	M	4.13E-12	mg/kg-day	9.1E+00	$(mg/kg\text{-}day)^{-1}$	4.E-11
	Arsenic	1.80E-03	mg/L	1.80E-03	mg/L	M	7.75E-09	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	1.E-08
	(Total)										3.E-08
Surface Water Dermal	Vinyl Chloride	1.30E-03	mg/L	1.30E-03	mg/L	M	8.53E-09	mg/kg-day	2.5E+00	$(mg/kg\text{-}day)^{-1}$	2.E-08
	Benz(a)anthracene	6.00E-05	mg/L	6.00E-05	mg/L	M	4.37E-08	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	3.E-08
	Benzo(a)pyrene	6.70E-05	mg/L	6.70E-05	mg/L	M	7.22E-08	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	5.E-07
	Benzo(b)fluoranthene	6.30E-05	mg/L	6.30E-05	mg/L	M	6.79E-08	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	5.E-08
	Benzo(k)fluoranthene	5.50E-05	mg/L	5.50E-05	mg/L	M	5.93E-08	mg/kg-day	7.3E-02	$(mg/kg\text{-}day)^{-1}$	4.E-09
	Chrysene	6.50E-05	mg/L	6.50E-05	mg/L	M	4.73E-08	mg/kg-day	7.3E-03	$(mg/kg\text{-}day)^{-1}$	3.E-10
	Dibenz(ah)anthracene	1.20E-05	mg/L	1.20E-05	mg/L	M	2.91E-08	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	2.E-07
	Indeno(123-cd)pyrene	6.50E-05	mg/L	6.50E-05	mg/L	M	1.11E-07	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	8.E-08
	Heptachlor Epoxide	9.60E-07	mg/L	9.60E-07	mg/L	M	9.49E-12	mg/kg-day	9.1E+00	$(mg/kg\text{-}day)^{-1}$	9.E-11
	Arsenic	1.80E-03	mg/L	1.80E-03	mg/L	M	1.62E-09	mg/kg-day	1.6E+00	$(mg/kg\text{-}day)^{-1}$	3.E-09
	(Total)										9.E-07
										Total Risk Across All Exposure Routes/Pathways	5.E-06

(1) COPCs shown in this table are carcinogens classifed as known (A), probable (B1, B2), possible (C), or "known/likely" under new EPA Cancer Guidelines.
(2) M indicates the Medium EPC was used while R indicates the Route EPC was used.
(3) The "Total Risk Across All Exposure Routes/Pathways" is the sum of the risk from the following exposure pathways: surface water ingestion and dermal contact, sediment ingestion and dermal contact, and fish ingestion.

TABLE 8.10.RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Kelley Brook and adjacent wetlands
Receptor Population: Fisherperson
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (2)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (3)
Sediment Ingestion	Benz(a)anthracene	1.10E-01	mg/kg	1.10E-01	mg/kg	M	9.45E-09	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	7.E-09
	Benzo(a)pyrene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	1.12E-08	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	8.E-08
	Benzo(b)fluoranthene	1.60E-01	mg/kg	1.60E-01	mg/kg	M	1.37E-08	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	1.E-08
	Benzo(k)fluoranthene	1.50E-01	mg/kg	1.50E-01	mg/kg	M	1.29E-08	mg/kg-day	7.3E-02	$(mg/kg\text{-}day)^{-1}$	9.E-10
	Chrysene	1.50E-01	mg/kg	1.50E-01	mg/kg	M	1.29E-08	mg/kg-day	7.3E-03	$(mg/kg\text{-}day)^{-1}$	9.E-11
	Dibenz(ah)anthracene	3.00E-02	mg/kg	3.00E-02	mg/kg	M	2.58E-09	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	2.E-08
	Indeno(123-cd)pyrene	8.60E-02	mg/kg	8.60E-02	mg/kg	M	7.39E-09	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	5.E-09
	Polychlorinated Biphenyls (4)	3.60E+00	mg/kg	3.60E+00	mg/kg	M	3.09E-07	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	6.E-07
	PCB-77	6.20E-03	mg/kg	6.20E-03	mg/kg	M	5.32E-10	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	8.E-09
	PCB-105	1.00E-02	mg/kg	1.00E-02	mg/kg	M	8.59E-10	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	1.E-08
	PCB-114	9.00E-04	mg/kg	9.00E-04	mg/kg	M	7.73E-11	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	6.E-09
	PCB-118	1.60E-02	mg/kg	1.60E-02	mg/kg	M	1.37E-09	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-08
	PCB-123	5.40E-03	mg/kg	5.40E-03	mg/kg	M	4.64E-10	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	7.E-09
	PCB-126	1.60E-04	mg/kg	1.60E-04	mg/kg	M	1.37E-11	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	2.E-07
	PCB-156	5.20E-03	mg/kg	5.20E-03	mg/kg	M	4.47E-10	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	3.E-08
	PCB-157	4.60E-04	mg/kg	4.60E-04	mg/kg	M	3.95E-11	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	3.E-09
	PCB-167	9.00E-03	mg/kg	9.00E-03	mg/kg	M	7.73E-10	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	1.E-09
	PCB-189	6.90E-04	mg/kg	6.90E-04	mg/kg	M	5.93E-11	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	9.E-10
	Arsenic	5.80E+01	mg/kg	5.80E+01	mg/kg	M	4.98E-06	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	7.E-06
	Beryllium	1.50E+00	mg/kg	1.50E+00	mg/kg	M	1.29E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Chromium VI (particulates)	2.90E+01	mg/kg	2.90E+01	mg/kg	M	2.49E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Mercury	4.20E-01	mg/kg	4.20E-01	mg/kg	M	3.61E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	(Total)										9.E-06
										Total Risk Across All Exposure Routes/Pathways	2.E-04

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (2)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (3)
Sediment Dermal	Benz(a)anthracene	1.10E-01	mg/kg	1.10E-01	mg/kg	M	3.73E-08	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	3.E-08
	Benzo(a)pyrene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	4.41E-08	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	3.E-07
	Benzo(b)fluoranthene	1.60E-01	mg/kg	1.60E-01	mg/kg	M	5.42E-08	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	4.E-08
	Benzo(k)fluoranthene	1.50E-01	mg/kg	1.50E-01	mg/kg	M	5.09E-08	mg/kg-day	7.3E-02	$(mg/kg\text{-}day)^{-1}$	4.E-09
	Chrysene	1.50E-01	mg/kg	1.50E-01	mg/kg	M	5.09E-08	mg/kg-day	7.3E-03	$(mg/kg\text{-}day)^{-1}$	4.E-10
	Dibenz(ah)anthracene	3.00E-02	mg/kg	3.00E-02	mg/kg	M	1.02E-08	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	7.E-08
	Indeno(123-cd)pyrene	8.60E-02	mg/kg	8.60E-02	mg/kg	M	2.92E-08	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	2.E-08
	Polychlorinated Biphenyls (4)	3.60E+00	mg/kg	3.60E+00	mg/kg	M	1.31E-06	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	3.E-06
	PCB-77	6.20E-03	mg/kg	6.20E-03	mg/kg	M	2.26E-09	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	3.E-08
	PCB-105	1.00E-02	mg/kg	1.00E-02	mg/kg	M	3.65E-09	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	5.E-08
	PCB-114	9.00E-04	mg/kg	9.00E-04	mg/kg	M	3.29E-10	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-08
	PCB-118	1.60E-02	mg/kg	1.60E-02	mg/kg	M	5.84E-09	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	9.E-08
	PCB-123	5.40E-03	mg/kg	5.40E-03	mg/kg	M	1.97E-09	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	3.E-08
	PCB-126	1.60E-04	mg/kg	1.60E-04	mg/kg	M	5.84E-11	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	9.E-07
	PCB-156	5.20E-03	mg/kg	5.20E-03	mg/kg	M	1.90E-09	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	1.E-07
	PCB-157	4.60E-04	mg/kg	4.60E-04	mg/kg	M	1.68E-10	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	1.E-08
	PCB-167	9.00E-03	mg/kg	9.00E-03	mg/kg	M	3.29E-09	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	5.E-09
	PCB-189	6.90E-04	mg/kg	6.90E-04	mg/kg	M	2.52E-10	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	4.E-09
	Arsenic	5.80E+01	mg/kg	5.80E+01	mg/kg	M	4.54E-06	mg/kg-day	1.6E+00	$(mg/kg\text{-}day)^{-1}$	7.E-06
	Beryllium	1.50E+00	mg/kg	1.50E+00	mg/kg	M	3.91E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Chromium VI (particulates)	2.90E+01	mg/kg	2.90E+01	mg/kg	M	7.56E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Mercury	4.20E-01	mg/kg	4.20E-01	mg/kg	M	1.10E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	(Total)										1.E-05
										Total Risk Across All Exposure Routes/Pathways	2.E-04

(1) COPCs shown in this table are carcinogens classifed as known (A), probable (B1, B2), possible (C), or "known/likely" under new EPA Cancer Guidelines.
(2) M indicates the Medium EPC was used while R indicates the Route EPC was used.

TABLE 8.10.CT
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Kelley Brook and adjacent wetlands
Receptor Population: Fisherperson
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (2)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (3)
Sediment Ingestion	Benz(a)anthracene	5.00E-02	mg/kg	5.00E-02	mg/kg	M	2.15E-10	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	2.E-10
	Benzo(a)pyrene	5.30E-02	mg/kg	5.30E-02	mg/kg	M	2.28E-10	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	2.E-09
	Benzo(b)fluoranthene	5.80E-02	mg/kg	5.80E-02	mg/kg	M	2.50E-10	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	2.E-10
	Benzo(k)fluoranthene	5.10E-02	mg/kg	5.10E-02	mg/kg	M	2.20E-10	mg/kg-day	7.3E-02	$(mg/kg\text{-}day)^{-1}$	2.E-11
	Chrysene	7.30E-02	mg/kg	7.30E-02	mg/kg	M	3.14E-10	mg/kg-day	7.3E-03	$(mg/kg\text{-}day)^{-1}$	2.E-12
	Dibenz(ah)anthracene	1.80E-02	mg/kg	1.80E-02	mg/kg	M	7.75E-11	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	6.E-10
	Indeno(123-cd)pyrene	3.60E-02	mg/kg	3.60E-02	mg/kg	M	1.55E-10	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	1.E-10
	Polychlorinated Biphenyls (4)	7.80E-01	mg/kg	7.80E-01	mg/kg	M	3.36E-09	mg/kg-day	1.0E+00	$(mg/kg\text{-}day)^{-1}$	3.E-09
	PCB-77	1.40E-03	mg/kg	1.40E-03	mg/kg	M	6.03E-12	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	9.E-11
	PCB-105	3.70E-03	mg/kg	3.70E-03	mg/kg	M	1.59E-11	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-10
	PCB-114	3.10E-04	mg/kg	3.10E-04	mg/kg	M	1.33E-12	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	1.E-10
	PCB-118	6.40E-03	mg/kg	6.40E-03	mg/kg	M	2.76E-11	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	4.E-10
	PCB-123	1.60E-03	mg/kg	1.60E-03	mg/kg	M	6.89E-12	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	1.E-10
	PCB-126	8.40E-05	mg/kg	8.40E-05	mg/kg	M	3.62E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	5.E-09
	PCB-156	1.20E-03	mg/kg	1.20E-03	mg/kg	M	5.17E-12	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	4.E-10
	PCB-157	2.00E-04	mg/kg	2.00E-04	mg/kg	M	8.61E-13	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	6.E-11
	PCB-167	2.40E-03	mg/kg	2.40E-03	mg/kg	M	1.03E-11	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	2.E-11
	PCB-189	2.40E-04	mg/kg	2.40E-04	mg/kg	M	1.03E-12	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-11
	Arsenic	5.80E+01	mg/kg	5.80E+01	mg/kg	M	2.50E-07	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	4.E-07
	Beryllium	1.50E+00	mg/kg	1.50E+00	mg/kg	M	6.46E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Chromium VI (particulates)	2.90E+01	mg/kg	2.90E+01	mg/kg	M	1.25E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Mercury	4.20E-01	mg/kg	4.20E-01	mg/kg	M	1.81E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	(Total)										4.E-07
										Total Risk Across All Exposure Routes/Pathways	5.E-06

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (2)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (3)
Sediment Dermal	Benz(a)anthracene	5.00E-02	mg/kg	5.00E-02	mg/kg	M	1.70E-09	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	1.E-09
	Benzo(a)pyrene	5.30E-02	mg/kg	5.30E-02	mg/kg	M	1.80E-09	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	1.E-08
	Benzo(b)fluoranthene	5.80E-02	mg/kg	5.80E-02	mg/kg	M	1.97E-09	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	1.E-09
	Benzo(k)fluoranthene	5.10E-02	mg/kg	5.10E-02	mg/kg	M	1.73E-09	mg/kg-day	7.3E-02	$(mg/kg\text{-}day)^{-1}$	1.E-10
	Chrysene	7.30E-02	mg/kg	7.30E-02	mg/kg	M	2.48E-09	mg/kg-day	7.3E-03	$(mg/kg\text{-}day)^{-1}$	2.E-11
	Dibenz(ah)anthracene	1.80E-02	mg/kg	1.80E-02	mg/kg	M	6.12E-10	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	4.E-09
	Indeno(123-cd)pyrene	3.60E-02	mg/kg	3.60E-02	mg/kg	M	1.22E-09	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	9.E-10
	Polychlorinated Biphenyls (4)	7.80E-01	mg/kg	7.80E-01	mg/kg	M	2.86E-08	mg/kg-day	1.0E+00	$(mg/kg\text{-}day)^{-1}$	3.E-08
	PCB-77	1.40E-03	mg/kg	1.40E-03	mg/kg	M	5.12E-11	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	8.E-10
	PCB-105	3.70E-03	mg/kg	3.70E-03	mg/kg	M	1.35E-10	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-09
	PCB-114	3.10E-04	mg/kg	3.10E-04	mg/kg	M	1.13E-11	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	9.E-10
	PCB-118	6.40E-03	mg/kg	6.40E-03	mg/kg	M	2.34E-10	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	4.E-09
	PCB-123	1.60E-03	mg/kg	1.60E-03	mg/kg	M	5.86E-11	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	9.E-10
	PCB-126	8.40E-05	mg/kg	8.40E-05	mg/kg	M	3.07E-12	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	5.E-08
	PCB-156	1.20E-03	mg/kg	1.20E-03	mg/kg	M	4.39E-11	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	3.E-09
	PCB-157	2.00E-04	mg/kg	2.00E-04	mg/kg	M	7.32E-12	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	5.E-10
	PCB-167	2.40E-03	mg/kg	2.40E-03	mg/kg	M	8.79E-11	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	1.E-10
	PCB-189	2.40E-04	mg/kg	2.40E-04	mg/kg	M	8.79E-12	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	1.E-10
	Arsenic	5.80E+01	mg/kg	5.80E+01	mg/kg	M	4.55E-07	mg/kg-day	1.6E+00	$(mg/kg\text{-}day)^{-1}$	7.E-07
	Beryllium	1.50E+00	mg/kg	1.50E+00	mg/kg	M	3.92E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Chromium VI (particulates)	2.90E+01	mg/kg	2.90E+01	mg/kg	M	7.58E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Mercury	4.20E-01	mg/kg	4.20E-01	mg/kg	M	1.10E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	(Total)										8.E-07
										Total Risk Across All Exposure Routes/Pathways	5.E-06

(1) COPCs shown in this table are carcinogens classifed as known (A), probable (B1, B2), possible (C), or "known/likely" under new EPA Cancer Guidelines.

(2) M indicates the Medium EPC was used while R indicates the Route EPC was used.

(3) The "Total Risk Across All Exposure Routes/Pathways" is the sum of the risk from the following exposure pathways: surface water ingestion and dermal contact,

TABLE 8.11.RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current/Future
Medium: Other (Fish Tissue)
Exposure Medium: Animal Tissue
Exposure Point: Brook Trout
Receptor Population: Fisherperson
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (2)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (3)
Food Ingestion	Aldrin	6.20E-05	mg/kg	6.20E-05	mg/kg	M	3.64E-09	mg/kg-day	1.7E+01	$(mg/kg\text{-}day)^{-1}$	6.E-08
	4,4'-DDE	5.90E-03	mg/kg	5.90E-03	mg/kg	M	3.47E-07	mg/kg-day	3.4E-01	$(mg/kg\text{-}day)^{-1}$	1.E-07
	4,4'-DDT	1.10E-02	mg/kg	1.10E-02	mg/kg	M	6.47E-07	mg/kg-day	3.4E-01	$(mg/kg\text{-}day)^{-1}$	2.E-07
	Dieldrin	5.90E-04	mg/kg	5.90E-04	mg/kg	M	3.47E-08	mg/kg-day	1.6E+01	$(mg/kg\text{-}day)^{-1}$	6.E-07
	Heptachlor Epoxide	1.60E-04	mg/kg	1.60E-04	mg/kg	M	9.40E-09	mg/kg-day	9.1E+00	$(mg/kg\text{-}day)^{-1}$	9.E-08
	Polychlorinated Biphenyls (4)	2.70E-01	mg/kg	2.70E-01	mg/kg	M	1.59E-05	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	3.E-05
	PCB-77	1.60E-04	mg/kg	1.60E-04	mg/kg	M	9.40E-09	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	1.E-07
	PCB-105	6.30E-04	mg/kg	6.30E-04	mg/kg	M	3.70E-08	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	6.E-07
	PCB-118	2.00E-03	mg/kg	2.00E-03	mg/kg	M	1.18E-07	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-06
	PCB-126	1.10E-05	mg/kg	1.10E-05	mg/kg	M	6.47E-10	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	1.E-05
	PCB-156	7.10E-03	mg/kg	7.10E-03	mg/kg	M	4.17E-07	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	3.E-05
	PCB-167	4.20E-04	mg/kg	4.20E-04	mg/kg	M	2.47E-08	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	4.E-08
	PCB-169	7.90E-07	mg/kg	7.90E-07	mg/kg	M	4.64E-11	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	7.E-08
	PCB-189	2.80E-04	mg/kg	2.80E-04	mg/kg	M	1.65E-08	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-07
	2,3,7,8-TCDF	5.80E-07	mg/kg	5.80E-07	mg/kg	M	3.41E-11	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	5.E-07
	Arsenic	3.60E-01	mg/kg	3.60E-01	mg/kg	M	2.12E-05	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	3.E-05
	Chromium VI (particulates)	3.30E-01	mg/kg	3.30E-01	mg/kg	M	1.94E-05	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Lead	6.20E+00	mg/kg	6.20E+00	mg/kg	M	3.64E-04	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Mercury	1.80E-01	mg/kg	1.80E-01	mg/kg	M	1.06E-05	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	(Total)										1.E-04
										Total Risk Across All Exposure Routes/Pathways	2.E-04

(1) COPCs shown in this table are carcinogens classifed as known (A), probable (B1, B2), possible (C), or "known/likely" under new EPA Cancer Guidelines.
(2) M indicates the Medium EPC was used while R indicates the Route EPC was used.
(3) The "Total Risk Across All Exposure Routes/Pathways" is the sum of the risk from the following exposure pathways: surface water ingestion and dermal contact,

TABLE 8.11.CT
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current/Future
Medium: Other (Fish Tissue)
Exposure Medium: Animal Tissue
Exposure Point: Brook Trout
Receptor Population: Fisherperson
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (2)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (3)
Food Ingestion	Aldrin	3.10E-05	mg/kg	3.10E-05	mg/kg	M	1.64E-10	mg/kg-day	1.7E+01	$(mg/kg\text{-}day)^{-1}$	3.E-09
	4,4'-DDE	5.90E-03	mg/kg	5.90E-03	mg/kg	M	3.12E-08	mg/kg-day	3.4E-01	$(mg/kg\text{-}day)^{-1}$	1.E-08
	4,4'-DDT	1.40E-03	mg/kg	1.40E-03	mg/kg	M	7.40E-09	mg/kg-day	3.4E-01	$(mg/kg\text{-}day)^{-1}$	3.E-09
	Dieldrin	5.90E-04	mg/kg	5.90E-04	mg/kg	M	3.12E-09	mg/kg-day	1.6E+01	$(mg/kg\text{-}day)^{-1}$	5.E-08
	Heptachlor Epoxide	1.60E-04	mg/kg	1.60E-04	mg/kg	M	8.46E-10	mg/kg-day	9.1E+00	$(mg/kg\text{-}day)^{-1}$	8.E-09
	Polychlorinated Biphenyls (4)	4.80E-02	mg/kg	4.80E-02	mg/kg	M	2.54E-07	mg/kg-day	1.0E+00	$(mg/kg\text{-}day)^{-1}$	3.E-07
	PCB-77	1.60E-04	mg/kg	1.60E-04	mg/kg	M	8.46E-10	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	1.E-08
	PCB-105	6.30E-04	mg/kg	6.30E-04	mg/kg	M	3.33E-09	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	5.E-08
	PCB-118	2.00E-03	mg/kg	2.00E-03	mg/kg	M	1.06E-08	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-07
	PCB-126	1.10E-05	mg/kg	1.10E-05	mg/kg	M	5.81E-11	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	9.E-07
	PCB-156	6.50E-04	mg/kg	6.50E-04	mg/kg	M	3.44E-09	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	3.E-07
	PCB-167	4.20E-04	mg/kg	4.20E-04	mg/kg	M	2.22E-09	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	3.E-09
	PCB-169	7.90E-07	mg/kg	7.90E-07	mg/kg	M	4.18E-12	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	6.E-09
	PCB-189	6.90E-05	mg/kg	6.90E-05	mg/kg	M	3.65E-10	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	5.E-09
	2,3,7,8-TCDF	4.40E-07	mg/kg	4.40E-07	mg/kg	M	2.33E-12	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	3.E-08
	Arsenic	8.80E-02	mg/kg	8.80E-02	mg/kg	M	4.65E-07	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	7.E-07
	Chromium VI (particulates)	3.30E-01	mg/kg	3.30E-01	mg/kg	M	1.74E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Lead	4.00E-01	mg/kg	4.00E-01	mg/kg	M	2.11E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Mercury	1.80E-01	mg/kg	1.80E-01	mg/kg	M	9.51E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	(Total)										2.E-06
										Total Risk Across All Exposure Routes/Pathways	5.E-06

(1) COPCs shown in this table are carcinogens classifed as known (A), probable (B1, B2), possible (C), or "known/likely" under new EPA Cancer Guidelines.
(2) M indicates the Medium EPC was used while R indicates the Route EPC was used.
(3) The "Total Risk Across All Exposure Routes/Pathways" is the sum of the risk from the following exposure pathways: surface water ingestion and dermal contact,

TABLE 8.12.RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Kelley Brook and adjacent wetlands
Receptor Population: Other Recreational Person
Receptor Age: Child

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (2)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (3)
Surface Water Ingestion	Vinyl Chloride	3.00E-03	mg/L	3.00E-03	mg/L	M	1.72E-07	mg/kg-day	2.5E+00	$(mg/kg\text{-}day)^{-1}$	4.E-07
	Benz(a)anthracene	3.90E-04	mg/L	3.90E-04	mg/L	M	2.24E-08	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	2.E-08
	Benzo(a)pyrene	4.40E-04	mg/L	4.40E-04	mg/L	M	2.53E-08	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	2.E-07
	Benzo(b)fluoranthene	4.10E-04	mg/L	4.10E-04	mg/L	M	2.35E-08	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	2.E-08
	Benzo(k)fluoranthene	3.50E-04	mg/L	3.50E-04	mg/L	M	2.01E-08	mg/kg-day	7.3E-02	$(mg/kg\text{-}day)^{-1}$	1.E-09
	Chrysene	4.20E-04	mg/L	4.20E-04	mg/L	M	2.41E-08	mg/kg-day	7.3E-03	$(mg/kg\text{-}day)^{-1}$	2.E-10
	Dibenz(ah)anthracene	6.10E-05	mg/L	6.10E-05	mg/L	M	3.50E-09	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	3.E-08
	Indeno(123-cd)pyrene	4.20E-04	mg/L	4.20E-04	mg/L	M	2.41E-08	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	2.E-08
	Heptachlor Epoxide	1.70E-06	mg/L	1.70E-06	mg/L	M	9.76E-11	mg/kg-day	9.1E+00	$(mg/kg\text{-}day)^{-1}$	9.E-10
	Arsenic	3.80E-03	mg/L	3.80E-03	mg/L	M	2.18E-07	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	3.E-07
	(Total)										1.E-06
Surface Water Dermal	Vinyl Chloride	3.00E-03	mg/L	3.00E-03	mg/L	M	6.11E-07	mg/kg-day	2.5E+00	$(mg/kg\text{-}day)^{-1}$	2.E-06
	Benz(a)anthracene	3.90E-04	mg/L	3.90E-04	mg/L	M	8.82E-06	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	6.E-06
	Benzo(a)pyrene	4.40E-04	mg/L	4.40E-04	mg/L	M	1.47E-05	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	1.E-04
	Benzo(b)fluoranthene	4.10E-04	mg/L	4.10E-04	mg/L	M	1.37E-05	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	1.E-05
	Benzo(k)fluoranthene	3.50E-04	mg/L	3.50E-04	mg/L	M	1.17E-05	mg/kg-day	7.3E-02	$(mg/kg\text{-}day)^{-1}$	9.E-07
	Chrysene	4.20E-04	mg/L	4.20E-04	mg/L	M	9.50E-06	mg/kg-day	7.3E-03	$(mg/kg\text{-}day)^{-1}$	7.E-08
	Dibenz(ah)anthracene	6.10E-05	mg/L	6.10E-05	mg/L	M	4.60E-06	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	3.E-05
	Indeno(123-cd)pyrene	4.20E-04	mg/L	4.20E-04	mg/L	M	2.23E-05	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	2.E-05
	Heptachlor Epoxide	1.70E-06	mg/L	1.70E-06	mg/L	M	5.22E-10	mg/kg-day	9.1E+00	$(mg/kg\text{-}day)^{-1}$	5.E-09
	Arsenic	3.80E-03	mg/L	3.80E-03	mg/L	M	1.06E-07	mg/kg-day	1.6E+00	$(mg/kg\text{-}day)^{-1}$	2.E-07
	(Total)										2.E-04
										Total Risk Across All Exposure Routes/Pathways	2.E-04

(1) COPCs shown in this table are carcinogens classifed as known (A), probable (B1, B2), possible (C), or "known/likely" under new EPA Cancer Guidelines.
(2) M indicates the Medium EPC was used while R indicates the Route EPC was used.

TABLE 8.12.CT
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Kelley Brook and adjacent wetlands
Receptor Population: Other Recreational Person
Receptor Age: Child

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (2)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (3)
Surface Water Ingestion	Vinyl Chloride	1.30E-03	mg/L	1.30E-03	mg/L	M	2.98E-08	mg/kg-day	2.5E+00	$(mg/kg\text{-}day)^{-1}$	7.E-08
	Benz(a)anthracene	6.00E-05	mg/L	6.00E-05	mg/L	M	1.38E-09	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	1.E-09
	Benzo(a)pyrene	6.70E-05	mg/L	6.70E-05	mg/L	M	1.54E-09	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	1.E-08
	Benzo(b)fluoranthene	6.30E-05	mg/L	6.30E-05	mg/L	M	1.45E-09	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	1.E-09
	Benzo(k)fluoranthene	5.50E-05	mg/L	5.50E-05	mg/L	M	1.26E-09	mg/kg-day	7.3E-02	$(mg/kg\text{-}day)^{-1}$	9.E-11
	Chrysene	6.50E-05	mg/L	6.50E-05	mg/L	M	1.49E-09	mg/kg-day	7.3E-03	$(mg/kg\text{-}day)^{-1}$	1.E-11
	Dibenz(ah)anthracene	1.20E-05	mg/L	1.20E-05	mg/L	M	2.76E-10	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	2.E-09
	Indeno(123-cd)pyrene	6.50E-05	mg/L	6.50E-05	mg/L	M	1.49E-09	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	1.E-09
	Heptachlor Epoxide	9.60E-07	mg/L	9.60E-07	mg/L	M	2.20E-11	mg/kg-day	9.1E+00	$(mg/kg\text{-}day)^{-1}$	2.E-10
	Arsenic	1.80E-03	mg/L	1.80E-03	mg/L	M	4.13E-08	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	6.E-08
	(Total)										2.E-07
Surface Water Dermal	Vinyl Chloride	1.30E-03	mg/L	1.30E-03	mg/L	M	1.06E-07	mg/kg-day	2.5E+00	$(mg/kg\text{-}day)^{-1}$	3.E-07
	Benz(a)anthracene	6.00E-05	mg/L	6.00E-05	mg/L	M	5.43E-07	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	4.E-07
	Benzo(a)pyrene	6.70E-05	mg/L	6.70E-05	mg/L	M	8.98E-07	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	7.E-06
	Benzo(b)fluoranthene	6.30E-05	mg/L	6.30E-05	mg/L	M	8.44E-07	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	6.E-07
	Benzo(k)fluoranthene	5.50E-05	mg/L	5.50E-05	mg/L	M	7.37E-07	mg/kg-day	7.3E-02	$(mg/kg\text{-}day)^{-1}$	5.E-08
	Chrysene	6.50E-05	mg/L	6.50E-05	mg/L	M	5.88E-07	mg/kg-day	7.3E-03	$(mg/kg\text{-}day)^{-1}$	4.E-09
	Dibenz(ah)anthracene	1.20E-05	mg/L	1.20E-05	mg/L	M	3.62E-07	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	3.E-06
	Indeno(123-cd)pyrene	6.50E-05	mg/L	6.50E-05	mg/L	M	1.38E-06	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	1.E-06
	Heptachlor Epoxide	9.60E-07	mg/L	9.60E-07	mg/L	M	1.18E-10	mg/kg-day	9.1E+00	$(mg/kg\text{-}day)^{-1}$	1.E-09
	Arsenic	1.80E-03	mg/L	1.80E-03	mg/L	M	2.01E-08	mg/kg-day	1.6E+00	$(mg/kg\text{-}day)^{-1}$	3.E-08
	(Total)										1.E-05
										Total Risk Across All Exposure Routes/Pathways	2.E-05

(1) COPCs shown in this table are carcinogens classifed as known (A), probable (B1, B2), possible (C), or "known/likely" under new EPA Cancer Guidelines.
(2) M indicates the Medium EPC was used while R indicates the Route EPC was used.
(3) The "Total Risk Across All Exposure Routes/Pathways" is the sum of the risk from surface water and sediment via ingestion and dermal contact.

TABLE 8.13.RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Kelley Brook and adjacent wetlands
Receptor Population: Other Recreational Person
Receptor Age: Child

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (2)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (3)
Sediment Ingestion	Benz(a)anthracene	1.10E-01	mg/kg	1.10E-01	mg/kg	M	1.26E-08	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	9.E-09
	Benzo(a)pyrene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	1.49E-08	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	1.E-07
	Benzo(b)fluoranthene	1.60E-01	mg/kg	1.60E-01	mg/kg	M	1.84E-08	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	1.E-08
	Benzo(k)fluoranthene	1.50E-01	mg/kg	1.50E-01	mg/kg	M	1.72E-08	mg/kg-day	7.3E-02	$(mg/kg\text{-}day)^{-1}$	1.E-09
	Chrysene	1.50E-01	mg/kg	1.50E-01	mg/kg	M	1.72E-08	mg/kg-day	7.3E-03	$(mg/kg\text{-}day)^{-1}$	1.E-10
	Dibenz(ah)anthracene	3.00E-02	mg/kg	3.00E-02	mg/kg	M	3.44E-09	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	3.E-08
	Indeno(123-cd)pyrene	8.60E-02	mg/kg	8.60E-02	mg/kg	M	9.87E-09	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	7.E-09
	Polychlorinated Biphenyls (4)	3.60E+00	mg/kg	3.60E+00	mg/kg	M	4.13E-07	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	8.E-07
	PCB-77	6.20E-03	mg/kg	6.20E-03	mg/kg	M	7.12E-10	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	1.E-08
	PCB-105	1.00E-02	mg/kg	1.00E-02	mg/kg	M	1.15E-09	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-08
	PCB-114	9.00E-04	mg/kg	9.00E-04	mg/kg	M	1.03E-10	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	8.E-09
	PCB-118	1.60E-02	mg/kg	1.60E-02	mg/kg	M	1.84E-09	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	3.E-08
	PCB-123	5.40E-03	mg/kg	5.40E-03	mg/kg	M	6.20E-10	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	9.E-09
	PCB-126	1.60E-04	mg/kg	1.60E-04	mg/kg	M	1.84E-11	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	3.E-07
	PCB-156	5.20E-03	mg/kg	5.20E-03	mg/kg	M	5.97E-10	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	4.E-08
	PCB-157	4.60E-04	mg/kg	4.60E-04	mg/kg	M	5.28E-11	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	4.E-09
	PCB-167	9.00E-03	mg/kg	9.00E-03	mg/kg	M	1.03E-09	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	2.E-09
	PCB-189	6.90E-04	mg/kg	6.90E-04	mg/kg	M	7.92E-11	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	1.E-09
	Arsenic	5.80E+01	mg/kg	5.80E+01	mg/kg	M	6.66E-06	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	1.E-05
	Beryllium	1.50E+00	mg/kg	1.50E+00	mg/kg	M	1.72E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Chromium VI (particulates)	2.90E+01	mg/kg	2.90E+01	mg/kg	M	3.33E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Mercury	4.20E-01	mg/kg	4.20E-01	mg/kg	M	4.82E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	(Total)										1.E-05
										Total Risk Across All Exposure Routes/Pathways	2.E-04

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (2)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (3)
Sediment Dermal	Benz(a)anthracene	1.10E-01	mg/kg	1.10E-01	mg/kg	M	8.41E-08	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	6.E-08
	Benzo(a)pyrene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	9.94E-08	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	7.E-07
	Benzo(b)fluoranthene	1.60E-01	mg/kg	1.60E-01	mg/kg	M	1.22E-07	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	9.E-08
	Benzo(k)fluoranthene	1.50E-01	mg/kg	1.50E-01	mg/kg	M	1.15E-07	mg/kg-day	7.3E-02	$(mg/kg\text{-}day)^{-1}$	8.E-09
	Chrysene	1.50E-01	mg/kg	1.50E-01	mg/kg	M	1.15E-07	mg/kg-day	7.3E-03	$(mg/kg\text{-}day)^{-1}$	8.E-10
	Dibenz(ah)anthracene	3.00E-02	mg/kg	3.00E-02	mg/kg	M	2.29E-08	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	2.E-07
	Indeno(123-cd)pyrene	8.60E-02	mg/kg	8.60E-02	mg/kg	M	6.58E-08	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	5.E-08
	Polychlorinated Biphenyls (4)	3.60E+00	mg/kg	3.60E+00	mg/kg	M	2.96E-06	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	6.E-06
	PCB-77	6.20E-03	mg/kg	6.20E-03	mg/kg	M	5.11E-09	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	8.E-08
	PCB-105	1.00E-02	mg/kg	1.00E-02	mg/kg	M	8.23E-09	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	1.E-07
	PCB-114	9.00E-04	mg/kg	9.00E-04	mg/kg	M	7.41E-10	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	6.E-08
	PCB-118	1.60E-02	mg/kg	1.60E-02	mg/kg	M	1.32E-08	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-07
	PCB-123	5.40E-03	mg/kg	5.40E-03	mg/kg	M	4.45E-09	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	7.E-08
	PCB-126	1.60E-04	mg/kg	1.60E-04	mg/kg	M	1.32E-10	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	2.E-06
	PCB-156	5.20E-03	mg/kg	5.20E-03	mg/kg	M	4.28E-09	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	3.E-07
	PCB-157	4.60E-04	mg/kg	4.60E-04	mg/kg	M	3.79E-10	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	3.E-08
	PCB-167	9.00E-03	mg/kg	9.00E-03	mg/kg	M	7.41E-09	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	1.E-08
	PCB-189	6.90E-04	mg/kg	6.90E-04	mg/kg	M	5.68E-10	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	9.E-09
	Arsenic	5.80E+01	mg/kg	5.80E+01	mg/kg	M	1.02E-05	mg/kg-day	1.6E+00	$(mg/kg\text{-}day)^{-1}$	2.E-05
	Beryllium	1.50E+00	mg/kg	1.50E+00	mg/kg	M	8.82E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Chromium VI (particulates)	2.90E+01	mg/kg	2.90E+01	mg/kg	M	1.71E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Mercury	4.20E-01	mg/kg	4.20E-01	mg/kg	M	2.47E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	(Total)										3.E-05
										Total Risk Across All Exposure Routes/Pathways	2.E-04

TABLE 8.13.CT
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Kelley Brook and adjacent wetlands
Receptor Population: Other Recreational Person
Receptor Age: Child

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (2)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (3)
Sediment Ingestion	Benz(a)anthracene	5.00E-02	mg/kg	5.00E-02	mg/kg	M	1.15E-09	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	8.E-10
	Benzo(a)pyrene	5.30E-02	mg/kg	5.30E-02	mg/kg	M	1.22E-09	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	9.E-09
	Benzo(b)fluoranthene	5.80E-02	mg/kg	5.80E-02	mg/kg	M	1.33E-09	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	1.E-09
	Benzo(k)fluoranthene	5.10E-02	mg/kg	5.10E-02	mg/kg	M	1.17E-09	mg/kg-day	7.3E-02	$(mg/kg\text{-}day)^{-1}$	9.E-11
	Chrysene	7.30E-02	mg/kg	7.30E-02	mg/kg	M	1.68E-09	mg/kg-day	7.3E-03	$(mg/kg\text{-}day)^{-1}$	1.E-11
	Dibenz(ah)anthracene	1.80E-02	mg/kg	1.80E-02	mg/kg	M	4.13E-10	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	3.E-09
	Indeno(123-cd)pyrene	3.60E-02	mg/kg	3.60E-02	mg/kg	M	8.27E-10	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	6.E-10
	Polychlorinated Biphenyls (4)	7.80E-01	mg/kg	7.80E-01	mg/kg	M	1.79E-08	mg/kg-day	1.0E+00	$(mg/kg\text{-}day)^{-1}$	2.E-08
	PCB-77	1.40E-03	mg/kg	1.40E-03	mg/kg	M	3.21E-11	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	5.E-10
	PCB-105	3.70E-03	mg/kg	3.70E-03	mg/kg	M	8.50E-11	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	1.E-09
	PCB-114	3.10E-04	mg/kg	3.10E-04	mg/kg	M	7.12E-12	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	5.E-10
	PCB-118	6.40E-03	mg/kg	6.40E-03	mg/kg	M	1.47E-10	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-09
	PCB-123	1.60E-03	mg/kg	1.60E-03	mg/kg	M	3.67E-11	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	6.E-10
	PCB-126	8.40E-05	mg/kg	8.40E-05	mg/kg	M	1.93E-12	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	3.E-08
	PCB-156	1.20E-03	mg/kg	1.20E-03	mg/kg	M	2.76E-11	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-09
	PCB-157	2.00E-04	mg/kg	2.00E-04	mg/kg	M	4.59E-12	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	3.E-10
	PCB-167	2.40E-03	mg/kg	2.40E-03	mg/kg	M	5.51E-11	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	8.E-11
	PCB-189	2.40E-04	mg/kg	2.40E-04	mg/kg	M	5.51E-12	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	8.E-11
	Arsenic	5.80E+01	mg/kg	5.80E+01	mg/kg	M	1.33E-06	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	2.E-06
	Beryllium	1.50E+00	mg/kg	1.50E+00	mg/kg	M	3.44E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Chromium VI (particulates)	2.90E+01	mg/kg	2.90E+01	mg/kg	M	6.66E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Mercury	4.20E-01	mg/kg	4.20E-01	mg/kg	M	9.64E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	(Total)										2.E-06
										Total Risk Across All Exposure Routes/Pathways	2.E-05

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (2)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (3)
Sediment Dermal	Benz(a)anthracene	5.00E-02	mg/kg	5.00E-02	mg/kg	M	1.53E-08	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	1.E-08
	Benzo(a)pyrene	5.30E-02	mg/kg	5.30E-02	mg/kg	M	1.62E-08	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	1.E-07
	Benzo(b)fluoranthene	5.80E-02	mg/kg	5.80E-02	mg/kg	M	1.77E-08	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	1.E-08
	Benzo(k)fluoranthene	5.10E-02	mg/kg	5.10E-02	mg/kg	M	1.56E-08	mg/kg-day	7.3E-02	$(mg/kg\text{-}day)^{-1}$	1.E-09
	Chrysene	7.30E-02	mg/kg	7.30E-02	mg/kg	M	2.23E-08	mg/kg-day	7.3E-03	$(mg/kg\text{-}day)^{-1}$	2.E-10
	Dibenz(ah)anthracene	1.80E-02	mg/kg	1.80E-02	mg/kg	M	5.51E-09	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	4.E-08
	Indeno(123-cd)pyrene	3.60E-02	mg/kg	3.60E-02	mg/kg	M	1.10E-08	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	8.E-09
	Polychlorinated Biphenyls (4)	7.80E-01	mg/kg	7.80E-01	mg/kg	M	2.57E-07	mg/kg-day	1.0E+00	$(mg/kg\text{-}day)^{-1}$	3.E-07
	PCB-77	1.40E-03	mg/kg	1.40E-03	mg/kg	M	4.61E-10	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	7.E-09
	PCB-105	3.70E-03	mg/kg	3.70E-03	mg/kg	M	1.22E-09	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-08
	PCB-114	3.10E-04	mg/kg	3.10E-04	mg/kg	M	1.02E-10	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	8.E-09
	PCB-118	6.40E-03	mg/kg	6.40E-03	mg/kg	M	2.11E-09	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	3.E-08
	PCB-123	1.60E-03	mg/kg	1.60E-03	mg/kg	M	5.27E-10	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	8.E-09
	PCB-126	8.40E-05	mg/kg	8.40E-05	mg/kg	M	2.77E-11	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	4.E-07
	PCB-156	1.20E-03	mg/kg	1.20E-03	mg/kg	M	3.95E-10	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	3.E-08
	PCB-157	2.00E-04	mg/kg	2.00E-04	mg/kg	M	6.59E-11	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	5.E-09
	PCB-167	2.40E-03	mg/kg	2.40E-03	mg/kg	M	7.90E-10	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	1.E-09
	PCB-189	2.40E-04	mg/kg	2.40E-04	mg/kg	M	7.90E-11	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	1.E-09
	Arsenic	5.80E+01	mg/kg	5.80E+01	mg/kg	M	4.09E-06	mg/kg-day	1.6E+00	$(mg/kg\text{-}day)^{-1}$	6.E-06
	Beryllium	1.50E+00	mg/kg	1.50E+00	mg/kg	M	3.53E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Chromium VI (particulates)	2.90E+01	mg/kg	2.90E+01	mg/kg	M	6.82E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Mercury	4.20E-01	mg/kg	4.20E-01	mg/kg	M	9.88E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	(Total)										7.E-06
										Total Risk Across All Exposure Routes/Pathways	2.E-05

(1) COPCs shown in this table are carcinogens classifed as known (A), probable (B1, B2), possible (C), or "known/likely" under new EPA Cancer Guidelines.
(2) M indicates the Medium EPC was used while R indicates the Route EPC was used.
(3) The "Total Risk Across All Exposure Routes/Pathways" is the sum of the risk from surface water and sediment via ingestion and dermal contact.
(4) The Polychlorinated Biphenyls (PCBs) risk is from the total PCB concentration minus the concentration of dioxin-like congeners.

TABLE 8.14.RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: 0 to 1 foot soil
Receptor Population: Trespasser
Receptor Age: Child

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (2)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (3)
Soil Ingestion	Tetrachloroethene	2.30E+00	mg/kg	2.30E+00	mg/kg	M	2.64E-07	mg/kg-day	5.2E-02	$(mg/kg\text{-}day)^{-1}$	1.E-08
	Naphthalene	5.90E-01	mg/kg	5.90E-01	mg/kg	M	6.77E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Benz(a)anthracene	3.70E+00	mg/kg	3.70E+00	mg/kg	M	4.25E-07	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	3.E-07
	Benzo(a)pyrene	2.00E+00	mg/kg	2.00E+00	mg/kg	M	2.30E-07	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	2.E-06
	Benzo(b)fluoranthene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	1.38E-07	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	1.E-07
	Benzo(k)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	1.95E-07	mg/kg-day	7.3E-02	$(mg/kg\text{-}day)^{-1}$	1.E-08
	Chrysene	2.10E+00	mg/kg	2.10E+00	mg/kg	M	2.41E-07	mg/kg-day	7.3E-03	$(mg/kg\text{-}day)^{-1}$	2.E-09
	Dibenz(ah)anthracene	2.80E-01	mg/kg	2.80E-01	mg/kg	M	3.21E-08	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	2.E-07
	Indeno(123-cd)pyrene	6.60E-01	mg/kg	6.60E-01	mg/kg	M	7.58E-08	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	6.E-08
	bis(2-Ethylhexyl)phthalate	1.30E+02	mg/kg	1.30E+02	mg/kg	M	1.49E-05	mg/kg-day	1.4E-02	$(mg/kg\text{-}day)^{-1}$	2.E-07
	Polychlorinated Biphenyls (4)	3.70E+02	mg/kg	3.70E+02	mg/kg	M	4.25E-05	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	8.E-05
	PCB-77	3.00E+00	mg/kg	3.00E+00	mg/kg	M	3.44E-07	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	5.E-06
	PCB-81	9.80E-02	mg/kg	9.80E-02	mg/kg	M	1.13E-08	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-07
	PCB-105	4.40E+00	mg/kg	4.40E+00	mg/kg	M	5.05E-07	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	8.E-06
	PCB-114	4.40E-01	mg/kg	4.40E-01	mg/kg	M	5.05E-08	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	4.E-06
	PCB-118	7.20E+00	mg/kg	7.20E+00	mg/kg	M	8.27E-07	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	1.E-05
	PCB-123	7.40E-01	mg/kg	7.40E-01	mg/kg	M	8.50E-08	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	1.E-06
	PCB-126	2.80E-02	mg/kg	2.80E-02	mg/kg	M	3.21E-09	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	5.E-05
	PCB-156	2.20E-01	mg/kg	2.20E-01	mg/kg	M	2.53E-08	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-06
	PCB-157	5.40E-02	mg/kg	5.40E-02	mg/kg	M	6.20E-09	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	5.E-07
	PCB-167	4.20E-01	mg/kg	4.20E-01	mg/kg	M	4.82E-08	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	7.E-08
	PCB-189	8.30E-03	mg/kg	8.30E-03	mg/kg	M	9.53E-10	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	1.E-08
	2,3,7,8-TCDD	3.90E-07	mg/kg	3.90E-07	mg/kg	M	4.48E-14	mg/kg-day	1.5E+05	$(mg/kg\text{-}day)^{-1}$	7.E-09
	1,2,3,7,8-PeCDD	3.60E-06	mg/kg	3.60E-06	mg/kg	M	4.13E-13	mg/kg-day	1.5E+05	$(mg/kg\text{-}day)^{-1}$	6.E-08
	1,2,3,4,7,8-HxCDD	5.10E-06	mg/kg	5.10E-06	mg/kg	M	5.86E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	9.E-09
	1,2,3,6,7,8-HxCDD	1.20E-05	mg/kg	1.20E-05	mg/kg	M	1.38E-12	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	2.E-08
	1,2,3,7,8,9-HxCDD	1.00E-05	mg/kg	1.00E-05	mg/kg	M	1.15E-12	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	2.E-08
	1,2,3,4,6,7,8-HpCDD	2.50E-04	mg/kg	2.50E-04	mg/kg	M	2.87E-11	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	4.E-08
	OCDD	2.00E-03	mg/kg	2.00E-03	mg/kg	M	2.30E-10	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	3.E-09
	2,3,7,8-TCDF	5.90E-05	mg/kg	5.90E-05	mg/kg	M	6.77E-12	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	1.E-07
	1,2,3,7,8-PeCDF	2.20E-05	mg/kg	2.20E-05	mg/kg	M	2.53E-12	mg/kg-day	7.5E+03	$(mg/kg\text{-}day)^{-1}$	2.E-08
	2,3,4,7,8-PeCDF	1.40E-04	mg/kg	1.40E-04	mg/kg	M	1.61E-11	mg/kg-day	7.5E+04	$(mg/kg\text{-}day)^{-1}$	1.E-06
	1,2,3,4,7,8-HxCDF	3.20E-05	mg/kg	3.20E-05	mg/kg	M	3.67E-12	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	6.E-08
	1,2,3,6,7,8-HxCDF	1.90E-05	mg/kg	1.90E-05	mg/kg	M	2.18E-12	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	3.E-08
	1,2,3,7,8,9-HxCDF	1.10E-05	mg/kg	1.10E-05	mg/kg	M	1.26E-12	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	2.E-08
	2,3,4,6,7,8-HxCDF	2.10E-05	mg/kg	2.10E-05	mg/kg	M	2.41E-12	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	4.E-08
	1,2,3,4,6,7,8-HpCDF	6.30E-05	mg/kg	6.30E-05	mg/kg	M	7.23E-12	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	1.E-08
	1,2,3,4,7,8,9-HpCDF	7.80E-06	mg/kg	7.80E-06	mg/kg	M	8.95E-13	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	1.E-09
	OCDF	1.00E-04	mg/kg	1.00E-04	mg/kg	M	1.15E-11	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-10
	Arsenic	7.00E+00	mg/kg	7.00E+00	mg/kg	M	8.04E-07	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	1.E-06
	Beryllium	3.60E-01	mg/kg	3.60E-01	mg/kg	M	4.13E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Cadmium (Food)	2.30E+01	mg/kg	2.30E+01	mg/kg	M	2.64E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Chromium VI (particulates)	5.30E+02	mg/kg	5.30E+02	mg/kg	M	6.08E-05	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Lead	9.00E+02	mg/kg	9.00E+02	mg/kg	M	1.03E-04	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Mercury	3.00E-01	mg/kg	3.00E-01	mg/kg	M	3.44E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	(Total)										2.E-04
										Total Risk Across Direct Exposure Routes/Pathways	2.E-04
										Total Risk Across All Exposure Routes/Pathways	2.E-04

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (2)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (3)
Soil	Tetrachloroethene	2.30E+00	mg/kg	2.30E+00	mg/kg	M	0.00E+00	mg/kg-day	5.2E-02	$(mg/kg\text{-}day)^{-1}$	---
Dermal	Naphthalene	5.90E-01	mg/kg	5.90E-01	mg/kg	M	1.66E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Benz(a)anthracene	3.70E+00	mg/kg	3.70E+00	mg/kg	M	1.35E-07	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	1.E-07
	Benzo(a)pyrene	2.00E+00	mg/kg	2.00E+00	mg/kg	M	7.31E-08	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	5.E-07
	Benzo(b)fluoranthene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	4.39E-08	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	3.E-08
	Benzo(k)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	6.22E-08	mg/kg-day	7.3E-02	$(mg/kg\text{-}day)^{-1}$	5.E-09
	Chrysene	2.10E+00	mg/kg	2.10E+00	mg/kg	M	7.68E-08	mg/kg-day	7.3E-03	$(mg/kg\text{-}day)^{-1}$	6.E-10
	Dibenz(ah)anthracene	2.80E-01	mg/kg	2.80E-01	mg/kg	M	1.02E-08	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	7.E-08
	Indeno(123-cd)pyrene	6.60E-01	mg/kg	6.60E-01	mg/kg	M	2.41E-08	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	2.E-08
	bis(2-Ethylhexyl)phthalate	1.30E+02	mg/kg	1.30E+02	mg/kg	M	4.75E-06	mg/kg-day	2.5E-02	$(mg/kg\text{-}day)^{-1}$	7.E-08
	Polychlorinated Biphenyls (4)	3.70E+02	mg/kg	3.70E+02	mg/kg	M	1.46E-05	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	3.E-05
	PCB-77	3.00E+00	mg/kg	3.00E+00	mg/kg	M	1.18E-07	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-06
	PCB-81	9.80E-02	mg/kg	9.80E-02	mg/kg	M	3.86E-09	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	6.E-08
	PCB-105	4.40E+00	mg/kg	4.40E+00	mg/kg	M	1.73E-07	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	3.E-06
	PCB-114	4.40E-01	mg/kg	4.40E-01	mg/kg	M	1.73E-08	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	1.E-06
	PCB-118	7.20E+00	mg/kg	7.20E+00	mg/kg	M	2.84E-07	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	4.E-06
	PCB-123	7.40E-01	mg/kg	7.40E-01	mg/kg	M	2.91E-08	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	4.E-07
	PCB-126	2.80E-02	mg/kg	2.80E-02	mg/kg	M	1.10E-09	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	2.E-05
	PCB-156	2.20E-01	mg/kg	2.20E-01	mg/kg	M	8.66E-09	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	6.E-07
	PCB-157	5.40E-02	mg/kg	5.40E-02	mg/kg	M	2.13E-09	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-07
	PCB-167	4.20E-01	mg/kg	4.20E-01	mg/kg	M	1.65E-08	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	2.E-08
	PCB-189	8.30E-03	mg/kg	8.30E-03	mg/kg	M	3.27E-10	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	5.E-09
	2,3,7,8-TCDD	3.90E-07	mg/kg	3.90E-07	mg/kg	M	3.29E-15	mg/kg-day	1.5E+05	$(mg/kg\text{-}day)^{-1}$	5.E-10
	1,2,3,7,8-PeCDD	3.60E-06	mg/kg	3.60E-06	mg/kg	M	3.04E-14	mg/kg-day	1.5E+05	$(mg/kg\text{-}day)^{-1}$	5.E-09
	1,2,3,4,7,8-HxCDD	5.10E-06	mg/kg	5.10E-06	mg/kg	M	4.30E-14	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	6.E-10
	1,2,3,6,7,8-HxCDD	1.20E-05	mg/kg	1.20E-05	mg/kg	M	1.01E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	2.E-09
	1,2,3,7,8,9-HxCDD	1.00E-05	mg/kg	1.00E-05	mg/kg	M	8.44E-14	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	1.E-09
	1,2,3,4,6,7,8-HpCDD	2.50E-04	mg/kg	2.50E-04	mg/kg	M	2.11E-12	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	3.E-09
	OCDD	2.00E-03	mg/kg	2.00E-03	mg/kg	M	1.69E-11	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	3.E-10
	2,3,7,8-TCDF	5.90E-05	mg/kg	5.90E-05	mg/kg	M	4.98E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	7.E-09
	1,2,3,7,8-PeCDF	2.20E-05	mg/kg	2.20E-05	mg/kg	M	1.86E-13	mg/kg-day	7.5E+03	$(mg/kg\text{-}day)^{-1}$	1.E-09
	2,3,4,7,8-PeCDF	1.40E-04	mg/kg	1.40E-04	mg/kg	M	1.18E-12	mg/kg-day	7.5E+04	$(mg/kg\text{-}day)^{-1}$	9.E-08
	1,2,3,4,7,8-HxCDF	3.20E-05	mg/kg	3.20E-05	mg/kg	M	2.70E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	4.E-09
	1,2,3,6,7,8-HxCDF	1.90E-05	mg/kg	1.90E-05	mg/kg	M	1.60E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	2.E-09
	1,2,3,7,8,9-HxCDF	1.10E-05	mg/kg	1.10E-05	mg/kg	M	9.28E-14	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	1.E-09
	2,3,4,6,7,8-HxCDF	2.10E-05	mg/kg	2.10E-05	mg/kg	M	1.77E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	3.E-09
	1,2,3,4,6,7,8-HpCDF	6.30E-05	mg/kg	6.30E-05	mg/kg	M	5.32E-13	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	8.E-10
	1,2,3,4,7,8,9-HpCDF	7.80E-06	mg/kg	7.80E-06	mg/kg	M	6.58E-14	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	1.E-10
	OCDF	1.00E-04	mg/kg	1.00E-04	mg/kg	M	8.44E-13	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	1.E-11
	Arsenic	7.00E+00	mg/kg	7.00E+00	mg/kg	M	5.91E-08	mg/kg-day	1.6E+00	$(mg/kg\text{-}day)^{-1}$	9.E-08
	Beryllium	3.60E-01	mg/kg	3.60E-01	mg/kg	M	1.01E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Cadmium (Food)	2.30E+01	mg/kg	2.30E+01	mg/kg	M	6.47E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Chromium VI (particulates)	5.30E+02	mg/kg	5.30E+02	mg/kg	M	1.49E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Lead	9.00E+02	mg/kg	9.00E+02	mg/kg	M	2.53E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Mercury	3.00E-01	mg/kg	3.00E-01	mg/kg	M	8.44E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	(Total)										6.E-05
										Total Risk Across Direct Exposure Routes/Pathways	2.E-04
										Total Risk Across All Exposure Routes/Pathways	2.E-04

(1) COPCs shown in this table are carcinogens classifed as known (A), probable (B1, B2), possible (C), or "known/likely" under new EPA Cancer Guidelines.
(2) M indicates the Medium EPC was used while R indicates the Route EPC was used.
(3) The "Total Risk Across Direct Exposure Routes/Pathways" is the risk from the soil ingestion and soil dermal contact exposure pathways.

TABLE 8.14.CT
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: 0 to 1 foot soil
Receptor Population: Trespasser
Receptor Age: Child

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (2)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (3)
Soil Ingestion	Tetrachloroethene	1.60E-01	mg/kg	1.60E-01	mg/kg	M	3.67E-09	mg/kg-day	5.2E-02	$(mg/kg\text{-}day)^{-1}$	2.E-10
	Naphthalene	7.10E-02	mg/kg	7.10E-02	mg/kg	M	1.63E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Benz(a)anthracene	3.70E+00	mg/kg	3.70E+00	mg/kg	M	8.50E-08	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	6.E-08
	Benzo(a)pyrene	4.70E-01	mg/kg	4.70E-01	mg/kg	M	1.08E-08	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	8.E-08
	Benzo(b)fluoranthene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	2.76E-08	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	2.E-08
	Benzo(k)fluoranthene	4.30E-01	mg/kg	4.30E-01	mg/kg	M	9.87E-09	mg/kg-day	7.3E-02	$(mg/kg\text{-}day)^{-1}$	7.E-10
	Chrysene	2.10E+00	mg/kg	2.10E+00	mg/kg	M	4.82E-08	mg/kg-day	7.3E-03	$(mg/kg\text{-}day)^{-1}$	4.E-10
	Dibenz(ah)anthracene	2.80E-01	mg/kg	2.80E-01	mg/kg	M	6.43E-09	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	5.E-08
	Indeno(123-cd)pyrene	6.60E-01	mg/kg	6.60E-01	mg/kg	M	1.52E-08	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	1.E-08
	bis(2-Ethylhexyl)phthalate	2.30E+01	mg/kg	2.30E+01	mg/kg	M	5.28E-07	mg/kg-day	1.4E-02	$(mg/kg\text{-}day)^{-1}$	7.E-09
	Polychlorinated Biphenyls (4)	3.70E+02	mg/kg	3.70E+02	mg/kg	M	8.50E-06	mg/kg-day	1.0E+00	$(mg/kg\text{-}day)^{-1}$	8.E-06
	PCB-77	7.30E-01	mg/kg	7.30E-01	mg/kg	M	1.68E-08	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	3.E-07
	PCB-81	3.30E-02	mg/kg	3.30E-02	mg/kg	M	7.58E-10	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	1.E-08
	PCB-105	1.00E+00	mg/kg	1.00E+00	mg/kg	M	2.30E-08	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	3.E-07
	PCB-114	1.00E-01	mg/kg	1.00E-01	mg/kg	M	2.30E-09	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-07
	PCB-118	1.70E+00	mg/kg	1.70E+00	mg/kg	M	3.90E-08	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	6.E-07
	PCB-123	1.80E-01	mg/kg	1.80E-01	mg/kg	M	4.13E-09	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	6.E-08
	PCB-126	8.00E-03	mg/kg	8.00E-03	mg/kg	M	1.84E-10	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	3.E-06
	PCB-156	5.80E-02	mg/kg	5.80E-02	mg/kg	M	1.33E-09	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	1.E-07
	PCB-157	1.30E-02	mg/kg	1.30E-02	mg/kg	M	2.98E-10	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-08
	PCB-167	1.10E-01	mg/kg	1.10E-01	mg/kg	M	2.53E-09	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	4.E-09
	PCB-189	8.30E-03	mg/kg	8.30E-03	mg/kg	M	1.91E-10	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	3.E-09
	2,3,7,8-TCDD	3.00E-07	mg/kg	3.00E-07	mg/kg	M	6.89E-15	mg/kg-day	1.5E+05	$(mg/kg\text{-}day)^{-1}$	1.E-09
	1,2,3,7,8-PeCDD	1.80E-06	mg/kg	1.80E-06	mg/kg	M	4.13E-14	mg/kg-day	1.5E+05	$(mg/kg\text{-}day)^{-1}$	6.E-09
	1,2,3,4,7,8-HxCDD	2.90E-06	mg/kg	2.90E-06	mg/kg	M	6.66E-14	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	1.E-09
	1,2,3,6,7,8-HxCDD	7.70E-06	mg/kg	7.70E-06	mg/kg	M	1.77E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	3.E-09
	1,2,3,7,8,9-HxCDD	5.70E-06	mg/kg	5.70E-06	mg/kg	M	1.31E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	2.E-09
	1,2,3,4,6,7,8-HpCDD	1.30E-04	mg/kg	1.30E-04	mg/kg	M	2.98E-12	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	4.E-09
	OCDD	1.00E-03	mg/kg	1.00E-03	mg/kg	M	2.30E-11	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	3.E-10
	2,3,7,8-TCDF	2.00E-05	mg/kg	2.00E-05	mg/kg	M	4.59E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	7.E-09
	1,2,3,7,8-PeCDF	7.70E-06	mg/kg	7.70E-06	mg/kg	M	1.77E-13	mg/kg-day	7.5E+03	$(mg/kg\text{-}day)^{-1}$	1.E-09
	2,3,4,7,8-PeCDF	5.50E-05	mg/kg	5.50E-05	mg/kg	M	1.26E-12	mg/kg-day	7.5E+04	$(mg/kg\text{-}day)^{-1}$	9.E-08
	1,2,3,4,7,8-HxCDF	1.50E-05	mg/kg	1.50E-05	mg/kg	M	3.44E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	5.E-09
	1,2,3,6,7,8-HxCDF	8.80E-06	mg/kg	8.80E-06	mg/kg	M	2.02E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	3.E-09
	1,2,3,7,8,9-HxCDF	4.30E-06	mg/kg	4.30E-06	mg/kg	M	9.87E-14	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	1.E-09
	2,3,4,6,7,8-HxCDF	1.00E-05	mg/kg	1.00E-05	mg/kg	M	2.30E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	3.E-09
	1,2,3,4,6,7,8-HpCDF	3.40E-05	mg/kg	3.40E-05	mg/kg	M	7.81E-13	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	1.E-09
	1,2,3,4,7,8,9-HpCDF	3.80E-06	mg/kg	3.80E-06	mg/kg	M	8.73E-14	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	1.E-10
	OCDF	5.20E-05	mg/kg	5.20E-05	mg/kg	M	1.19E-12	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-11
	Arsenic	7.00E+00	mg/kg	7.00E+00	mg/kg	M	1.61E-07	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	2.E-07
	Beryllium	3.60E-01	mg/kg	3.60E-01	mg/kg	M	8.27E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Cadmium (Food)	1.10E+00	mg/kg	1.10E+00	mg/kg	M	2.53E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Chromium VI (particulates)	3.10E+01	mg/kg	3.10E+01	mg/kg	M	7.12E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Lead	9.00E+02	mg/kg	9.00E+02	mg/kg	M	2.07E-05	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Mercury	3.00E-01	mg/kg	3.00E-01	mg/kg	M	6.89E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	(Total)										1.E-05
										Total Risk Across Direct Exposure Routes/Pathways	1.E-05
										Total Risk Across All Exposure Routes/Pathways	1.E-05

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (2)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (3)
Soil	Tetrachloroethene	1.60E-01	mg/kg	1.60E-01	mg/kg	M	0.00E+00	mg/kg-day	5.2E-02	$(mg/kg\text{-}day)^{-1}$	---
Dermal	Naphthalene	7.10E-02	mg/kg	7.10E-02	mg/kg	M	1.14E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Benz(a)anthracene	3.70E+00	mg/kg	3.70E+00	mg/kg	M	7.73E-09	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	6.E-09
	Benzo(a)pyrene	4.70E-01	mg/kg	4.70E-01	mg/kg	M	9.82E-10	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	7.E-09
	Benzo(b)fluoranthene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	2.51E-09	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	2.E-09
	Benzo(k)fluoranthene	4.30E-01	mg/kg	4.30E-01	mg/kg	M	8.98E-10	mg/kg-day	7.3E-02	$(mg/kg\text{-}day)^{-1}$	7.E-11
	Chrysene	2.10E+00	mg/kg	2.10E+00	mg/kg	M	4.39E-09	mg/kg-day	7.3E-03	$(mg/kg\text{-}day)^{-1}$	3.E-11
	Dibenz(ah)anthracene	2.80E-01	mg/kg	2.80E-01	mg/kg	M	5.85E-10	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	4.E-09
	Indeno(123-cd)pyrene	6.60E-01	mg/kg	6.60E-01	mg/kg	M	1.38E-09	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	1.E-09
	bis(2-Ethylhexyl)phthalate	2.30E+01	mg/kg	2.30E+01	mg/kg	M	4.81E-08	mg/kg-day	2.5E-02	$(mg/kg\text{-}day)^{-1}$	7.E-10
	Polychlorinated Biphenyls (4)	3.70E+02	mg/kg	3.70E+02	mg/kg	M	8.33E-07	mg/kg-day	1.0E+00	$(mg/kg\text{-}day)^{-1}$	8.E-07
	PCB-77	7.30E-01	mg/kg	7.30E-01	mg/kg	M	1.64E-09	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-08
	PCB-81	3.30E-02	mg/kg	3.30E-02	mg/kg	M	7.43E-11	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	1.E-09
	PCB-105	1.00E+00	mg/kg	1.00E+00	mg/kg	M	2.25E-09	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	3.E-08
	PCB-114	1.00E-01	mg/kg	1.00E-01	mg/kg	M	2.25E-10	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-08
	PCB-118	1.70E+00	mg/kg	1.70E+00	mg/kg	M	3.83E-09	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	6.E-08
	PCB-123	1.80E-01	mg/kg	1.80E-01	mg/kg	M	4.05E-10	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	6.E-09
	PCB-126	8.00E-03	mg/kg	8.00E-03	mg/kg	M	1.80E-11	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	3.E-07
	PCB-156	5.80E-02	mg/kg	5.80E-02	mg/kg	M	1.31E-10	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	1.E-08
	PCB-157	1.30E-02	mg/kg	1.30E-02	mg/kg	M	2.93E-11	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-09
	PCB-167	1.10E-01	mg/kg	1.10E-01	mg/kg	M	2.48E-10	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	4.E-10
	PCB-189	8.30E-03	mg/kg	8.30E-03	mg/kg	M	1.87E-11	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	3.E-10
	2,3,7,8-TCDD	3.00E-07	mg/kg	3.00E-07	mg/kg	M	1.45E-16	mg/kg-day	1.5E+05	$(mg/kg\text{-}day)^{-1}$	2.E-11
	1,2,3,7,8-PeCDD	1.80E-06	mg/kg	1.80E-06	mg/kg	M	8.68E-16	mg/kg-day	1.5E+05	$(mg/kg\text{-}day)^{-1}$	1.E-10
	1,2,3,4,7,8-HxCDD	2.90E-06	mg/kg	2.90E-06	mg/kg	M	1.40E-15	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	2.E-11
	1,2,3,6,7,8-HxCDD	7.70E-06	mg/kg	7.70E-06	mg/kg	M	3.71E-15	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	6.E-11
	1,2,3,7,8,9-HxCDD	5.70E-06	mg/kg	5.70E-06	mg/kg	M	2.75E-15	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	4.E-11
	1,2,3,4,6,7,8-HpCDD	1.30E-04	mg/kg	1.30E-04	mg/kg	M	6.27E-14	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	9.E-11
	OCDD	1.00E-03	mg/kg	1.00E-03	mg/kg	M	4.82E-13	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	7.E-12
	2,3,7,8-TCDF	2.00E-05	mg/kg	2.00E-05	mg/kg	M	9.64E-15	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	1.E-10
	1,2,3,7,8-PeCDF	7.70E-06	mg/kg	7.70E-06	mg/kg	M	3.71E-15	mg/kg-day	7.5E+03	$(mg/kg\text{-}day)^{-1}$	3.E-11
	2,3,4,7,8-PeCDF	5.50E-05	mg/kg	5.50E-05	mg/kg	M	2.65E-14	mg/kg-day	7.5E+04	$(mg/kg\text{-}day)^{-1}$	2.E-09
	1,2,3,4,7,8-HxCDF	1.50E-05	mg/kg	1.50E-05	mg/kg	M	7.23E-15	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	1.E-10
	1,2,3,6,7,8-HxCDF	8.80E-06	mg/kg	8.80E-06	mg/kg	M	4.24E-15	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	6.E-11
	1,2,3,7,8,9-HxCDF	4.30E-06	mg/kg	4.30E-06	mg/kg	M	2.07E-15	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	3.E-11
	2,3,4,6,7,8-HxCDF	1.00E-05	mg/kg	1.00E-05	mg/kg	M	4.82E-15	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	7.E-11
	1,2,3,4,6,7,8-HpCDF	3.40E-05	mg/kg	3.40E-05	mg/kg	M	1.64E-14	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	2.E-11
	1,2,3,4,7,8,9-HpCDF	3.80E-06	mg/kg	3.80E-06	mg/kg	M	1.83E-15	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	3.E-12
	OCDF	5.20E-05	mg/kg	5.20E-05	mg/kg	M	2.51E-14	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	4.E-13
	Arsenic	7.00E+00	mg/kg	7.00E+00	mg/kg	M	3.38E-09	mg/kg-day	1.6E+00	$(mg/kg\text{-}day)^{-1}$	5.E-09
	Beryllium	3.60E-01	mg/kg	3.60E-01	mg/kg	M	5.79E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Cadmium (Food)	1.10E+00	mg/kg	1.10E+00	mg/kg	M	1.77E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Chromium VI (particulates)	3.10E+01	mg/kg	3.10E+01	mg/kg	M	4.98E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Lead	9.00E+02	mg/kg	9.00E+02	mg/kg	M	1.45E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Mercury	3.00E-01	mg/kg	3.00E-01	mg/kg	M	4.82E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	(Total)										1.E-06
										Total Risk Across Direct Exposure Routes/Pathways	1.E-05
										Total Risk Across All Exposure Routes/Pathways	1.E-05

(1) COPCs shown in this table are carcinogens classifed as known (A), probable (B1, B2), possible (C), or "known/likely" under new EPA Cancer Guidelines.
(2) M indicates the Medium EPC was used while R indicates the Route EPC was used.
(3) The "Total Risk Across Direct Exposure Routes/Pathways" is the risk from the soil ingestion and soil dermal contact exposure pathways.
The "Total Risk Across All Exposure Routes/Pathways" is the risk from the direct exposure pathways, plus the risk from the soil dust and vapor inhalation pathways.
(4) The Polychlorinated Biphenyls (PCBs) risk is from the total PCB concentration minus the concentration of dioxin-like congeners.

TABLE 8.15.RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Surface and Subsurface Soil
Exposure Point: 0 to 10 foot soil
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (2)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (3)
Soil Ingestion	Tetrachloroethene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	5.23E-09	mg/kg-day	5.2E-02	$(mg/kg\text{-}day)^{-1}$	3.E-10
	Naphthalene	8.00E-01	mg/kg	8.00E-01	mg/kg	M	3.22E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Benz(a)anthracene	8.80E-01	mg/kg	8.80E-01	mg/kg	M	3.54E-08	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	3.E-08
	Benzo(a)pyrene	2.00E+00	mg/kg	2.00E+00	mg/kg	M	8.05E-08	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	6.E-07
	Benzo(b)fluoranthene	5.40E-01	mg/kg	5.40E-01	mg/kg	M	2.17E-08	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	2.E-08
	Benzo(k)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	6.84E-08	mg/kg-day	7.3E-02	$(mg/kg\text{-}day)^{-1}$	5.E-09
	Chrysene	7.50E-01	mg/kg	7.50E-01	mg/kg	M	3.02E-08	mg/kg-day	7.3E-03	$(mg/kg\text{-}day)^{-1}$	2.E-10
	Dibenz(ah)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	8.86E-09	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	6.E-08
	Indeno(123-cd)pyrene	3.60E-01	mg/kg	3.60E-01	mg/kg	M	1.45E-08	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	1.E-08
	bis(2-Ethylhexyl)phthalate	3.40E+01	mg/kg	3.40E+01	mg/kg	M	1.37E-06	mg/kg-day	1.4E-02	$(mg/kg\text{-}day)^{-1}$	2.E-08
	Polychlorinated Biphenyls (4)	8.00E+01	mg/kg	8.00E+01	mg/kg	M	3.22E-06	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	6.E-06
	PCB-77	3.00E+00	mg/kg	3.00E+00	mg/kg	M	1.21E-07	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-06
	PCB-81	5.30E-02	mg/kg	5.30E-02	mg/kg	M	2.13E-09	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	3.E-08
	PCB-105	2.20E+00	mg/kg	2.20E+00	mg/kg	M	8.86E-08	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	1.E-06
	PCB-114	1.40E-01	mg/kg	1.40E-01	mg/kg	M	5.64E-09	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	4.E-07
	PCB-118	3.30E+00	mg/kg	3.30E+00	mg/kg	M	1.33E-07	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-06
	PCB-123	1.80E-01	mg/kg	1.80E-01	mg/kg	M	7.25E-09	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	1.E-07
	PCB-126	7.60E-03	mg/kg	7.60E-03	mg/kg	M	3.06E-10	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	5.E-06
	PCB-156	5.00E-02	mg/kg	5.00E-02	mg/kg	M	2.01E-09	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-07
	PCB-157	1.10E-02	mg/kg	1.10E-02	mg/kg	M	4.43E-10	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	3.E-08
	PCB-167	8.70E-02	mg/kg	8.70E-02	mg/kg	M	3.50E-09	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	5.E-09
	PCB-189	3.00E-03	mg/kg	3.00E-03	mg/kg	M	1.21E-10	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-13
	2,3,7,8-TCDD	3.90E-07	mg/kg	3.90E-07	mg/kg	M	1.57E-14	mg/kg-day	1.5E+05	$(mg/kg\text{-}day)^{-1}$	2.E-09
	1,2,3,7,8-PeCDD	3.60E-06	mg/kg	3.60E-06	mg/kg	M	1.45E-13	mg/kg-day	1.5E+05	$(mg/kg\text{-}day)^{-1}$	2.E-08
	1,2,3,4,7,8-HxCDD	5.10E-06	mg/kg	5.10E-06	mg/kg	M	2.05E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	3.E-09
	1,2,3,6,7,8-HxCDD	1.20E-05	mg/kg	1.20E-05	mg/kg	M	4.83E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	7.E-09
	1,2,3,7,8,9-HxCDD	1.00E-05	mg/kg	1.00E-05	mg/kg	M	4.03E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	6.E-09
	1,2,3,4,6,7,8-HpCDD	2.50E-04	mg/kg	2.50E-04	mg/kg	M	1.01E-11	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	2.E-08
	OCDD	2.00E-03	mg/kg	2.00E-03	mg/kg	M	8.05E-11	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	1.E-09
	2,3,7,8-TCDF	5.90E-05	mg/kg	5.90E-05	mg/kg	M	2.38E-12	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	4.E-08
	1,2,3,7,8-PeCDF	2.20E-05	mg/kg	2.20E-05	mg/kg	M	8.86E-13	mg/kg-day	7.5E+03	$(mg/kg\text{-}day)^{-1}$	7.E-09
	2,3,4,7,8-PeCDF	1.40E-04	mg/kg	1.40E-04	mg/kg	M	5.64E-12	mg/kg-day	7.5E+04	$(mg/kg\text{-}day)^{-1}$	4.E-07
	1,2,3,4,7,8-HxCDF	3.20E-05	mg/kg	3.20E-05	mg/kg	M	1.29E-12	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	2.E-08
	1,2,3,6,7,8-HxCDF	1.90E-05	mg/kg	1.90E-05	mg/kg	M	7.65E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	1.E-08
	1,2,3,7,8,9-HxCDF	1.10E-05	mg/kg	1.10E-05	mg/kg	M	4.43E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	7.E-09
	2,3,4,6,7,8-HxCDF	2.10E-05	mg/kg	2.10E-05	mg/kg	M	8.45E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	1.E-08
	1,2,3,4,6,7,8-HpCDF	6.30E-05	mg/kg	6.30E-05	mg/kg	M	2.54E-12	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	4.E-09
	1,2,3,4,7,8,9-HpCDF	7.80E-06	mg/kg	7.80E-06	mg/kg	M	3.14E-13	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	5.E-10
	OCDF	1.00E-04	mg/kg	1.00E-04	mg/kg	M	4.03E-12	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	6.E-11
	Arsenic	6.60E+00	mg/kg	6.60E+00	mg/kg	M	2.66E-07	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	4.E-07
	Beryllium	1.80E+00	mg/kg	1.80E+00	mg/kg	M	7.25E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Cadmium (Food)	4.40E+01	mg/kg	4.40E+01	mg/kg	M	1.77E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Chromium VI (particulates)	5.30E+02	mg/kg	5.30E+02	mg/kg	M	2.13E-05	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Lead	4.90E+02	mg/kg	4.90E+02	mg/kg	M	1.97E-05	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Mercury	2.40E+01	mg/kg	2.40E+01	mg/kg	M	9.66E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	(Total)										2.E-05
										Total Risk Across Direct Exposure Routes/Pathways	2.E-04
										Total Risk Across All Exposure Routes/Pathways	2.E-04

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (2)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (3)
Soil	Tetrachloroethene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	0.00E+00	mg/kg-day	5.2E-02	(mg/kg-day)$^{-1}$	---
Dermal	Naphthalene	8.00E-01	mg/kg	8.00E-01	mg/kg	M	4.90E-08	mg/kg-day	NA	(mg/kg-day)$^{-1}$	---
	Benz(a)anthracene	8.80E-01	mg/kg	8.80E-01	mg/kg	M	7.01E-09	mg/kg-day	7.3E-01	(mg/kg-day)$^{-1}$	5.E-09
	Benzo(a)pyrene	2.00E+00	mg/kg	2.00E+00	mg/kg	M	1.59E-08	mg/kg-day	7.3E+00	(mg/kg-day)$^{-1}$	1.E-07
	Benzo(b)fluoranthene	5.40E-01	mg/kg	5.40E-01	mg/kg	M	4.30E-09	mg/kg-day	7.3E-01	(mg/kg-day)$^{-1}$	3.E-09
	Benzo(k)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	1.35E-08	mg/kg-day	7.3E-02	(mg/kg-day)$^{-1}$	1.E-09
	Chrysene	7.50E-01	mg/kg	7.50E-01	mg/kg	M	5.97E-09	mg/kg-day	7.3E-03	(mg/kg-day)$^{-1}$	4.E-11
	Dibenz(ah)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	1.75E-09	mg/kg-day	7.3E+00	(mg/kg-day)$^{-1}$	1.E-08
	Indeno(123-cd)pyrene	3.60E-01	mg/kg	3.60E-01	mg/kg	M	2.87E-09	mg/kg-day	7.3E-01	(mg/kg-day)$^{-1}$	2.E-09
	bis(2-Ethylhexyl)phthalate	3.40E+01	mg/kg	3.40E+01	mg/kg	M	2.71E-07	mg/kg-day	2.5E-02	(mg/kg-day)$^{-1}$	4.E-09
	Polychlorinated Biphenyls (4)	8.00E+01	mg/kg	8.00E+01	mg/kg	M	6.86E-07	mg/kg-day	2.0E+00	(mg/kg-day)$^{-1}$	1.E-06
	PCB-77	3.00E+00	mg/kg	3.00E+00	mg/kg	M	2.57E-08	mg/kg-day	1.5E+01	(mg/kg-day)$^{-1}$	4.E-07
	PCB-81	5.30E-02	mg/kg	5.30E-02	mg/kg	M	4.54E-10	mg/kg-day	1.5E+01	(mg/kg-day)$^{-1}$	7.E-09
	PCB-105	2.20E+00	mg/kg	2.20E+00	mg/kg	M	1.89E-08	mg/kg-day	1.5E+01	(mg/kg-day)$^{-1}$	3.E-07
	PCB-114	1.40E-01	mg/kg	1.40E-01	mg/kg	M	1.20E-09	mg/kg-day	7.5E+01	(mg/kg-day)$^{-1}$	9.E-08
	PCB-118	3.30E+00	mg/kg	3.30E+00	mg/kg	M	2.83E-08	mg/kg-day	1.5E+01	(mg/kg-day)$^{-1}$	4.E-07
	PCB-123	1.80E-01	mg/kg	1.80E-01	mg/kg	M	1.54E-09	mg/kg-day	1.5E+01	(mg/kg-day)$^{-1}$	2.E-08
	PCB-126	7.60E-03	mg/kg	7.60E-03	mg/kg	M	6.52E-11	mg/kg-day	1.5E+04	(mg/kg-day)$^{-1}$	1.E-06
	PCB-156	5.00E-02	mg/kg	5.00E-02	mg/kg	M	4.29E-10	mg/kg-day	7.5E+01	(mg/kg-day)$^{-1}$	3.E-08
	PCB-157	1.10E-02	mg/kg	1.10E-02	mg/kg	M	9.43E-11	mg/kg-day	7.5E+01	(mg/kg-day)$^{-1}$	7.E-09
	PCB-167	8.70E-02	mg/kg	8.70E-02	mg/kg	M	7.46E-10	mg/kg-day	1.5E+00	(mg/kg-day)$^{-1}$	1.E-09
	PCB-189	3.00E-03	mg/kg	3.00E-03	mg/kg	M	2.57E-11	mg/kg-day	1.5E+01	(mg/kg-day)$^{-1}$	4.E-10
	2,3,7,8-TCDD	3.90E-07	mg/kg	3.90E-07	mg/kg	M	7.17E-16	mg/kg-day	1.5E+05	(mg/kg-day)$^{-1}$	1.E-10
	1,2,3,7,8-PeCDD	3.60E-06	mg/kg	3.60E-06	mg/kg	M	6.62E-15	mg/kg-day	1.5E+05	(mg/kg-day)$^{-1}$	1.E-09
	1,2,3,4,7,8-HxCDD	5.10E-06	mg/kg	5.10E-06	mg/kg	M	9.37E-15	mg/kg-day	1.5E+04	(mg/kg-day)$^{-1}$	1.E-10
	1,2,3,6,7,8-HxCDD	1.20E-05	mg/kg	1.20E-05	mg/kg	M	2.21E-14	mg/kg-day	1.5E+04	(mg/kg-day)$^{-1}$	3.E-10
	1,2,3,7,8,9-HxCDD	1.00E-05	mg/kg	1.00E-05	mg/kg	M	1.84E-14	mg/kg-day	1.5E+04	(mg/kg-day)$^{-1}$	3.E-10
	1,2,3,4,6,7,8-HpCDD	2.50E-04	mg/kg	2.50E-04	mg/kg	M	4.59E-13	mg/kg-day	1.5E+03	(mg/kg-day)$^{-1}$	7.E-10
	OCDD	2.00E-03	mg/kg	2.00E-03	mg/kg	M	3.68E-12	mg/kg-day	1.5E+01	(mg/kg-day)$^{-1}$	6.E-11
	2,3,7,8-TCDF	5.90E-05	mg/kg	5.90E-05	mg/kg	M	1.08E-13	mg/kg-day	1.5E+04	(mg/kg-day)$^{-1}$	2.E-09
	1,2,3,7,8-PeCDF	2.20E-05	mg/kg	2.20E-05	mg/kg	M	4.04E-14	mg/kg-day	7.5E+03	(mg/kg-day)$^{-1}$	3.E-10
	2,3,4,7,8-PeCDF	1.40E-04	mg/kg	1.40E-04	mg/kg	M	2.57E-13	mg/kg-day	7.5E+04	(mg/kg-day)$^{-1}$	2.E-08
	1,2,3,4,7,8-HxCDF	3.20E-05	mg/kg	3.20E-05	mg/kg	M	5.88E-14	mg/kg-day	1.5E+04	(mg/kg-day)$^{-1}$	9.E-10
	1,2,3,6,7,8-HxCDF	1.90E-05	mg/kg	1.90E-05	mg/kg	M	3.49E-14	mg/kg-day	1.5E+04	(mg/kg-day)$^{-1}$	5.E-10
	1,2,3,7,8,9-HxCDF	1.10E-05	mg/kg	1.10E-05	mg/kg	M	2.02E-14	mg/kg-day	1.5E+04	(mg/kg-day)$^{-1}$	3.E-10
	2,3,4,6,7,8-HxCDF	2.10E-05	mg/kg	2.10E-05	mg/kg	M	3.86E-14	mg/kg-day	1.5E+04	(mg/kg-day)$^{-1}$	6.E-10
	1,2,3,4,6,7,8-HpCDF	6.30E-05	mg/kg	6.30E-05	mg/kg	M	1.16E-13	mg/kg-day	1.5E+03	(mg/kg-day)$^{-1}$	2.E-10
	1,2,3,4,7,8,9-HpCDF	7.80E-06	mg/kg	7.80E-06	mg/kg	M	1.43E-14	mg/kg-day	1.5E+03	(mg/kg-day)$^{-1}$	2.E-11
	OCDF	1.00E-04	mg/kg	1.00E-04	mg/kg	M	1.84E-13	mg/kg-day	1.5E+01	(mg/kg-day)$^{-1}$	3.E-12
	Arsenic	6.60E+00	mg/kg	6.60E+00	mg/kg	M	1.21E-08	mg/kg-day	1.6E+00	(mg/kg-day)$^{-1}$	2.E-08
	Beryllium	1.80E+00	mg/kg	1.80E+00	mg/kg	M	1.10E-09	mg/kg-day	NA	(mg/kg-day)$^{-1}$	---
	Cadmium (Food)	4.40E+01	mg/kg	4.40E+01	mg/kg	M	2.70E-08	mg/kg-day	NA	(mg/kg-day)$^{-1}$	---
	Chromium VI (particulates)	5.30E+02	mg/kg	5.30E+02	mg/kg	M	3.25E-07	mg/kg-day	NA	(mg/kg-day)$^{-1}$	---
	Lead	4.90E+02	mg/kg	4.90E+02	mg/kg	M	3.00E-07	mg/kg-day	NA	(mg/kg-day)$^{-1}$	---
	Mercury	2.40E+01	mg/kg	2.40E+01	mg/kg	M	1.47E-08	mg/kg-day	NA	(mg/kg-day)$^{-1}$	---
	(Total)										4.E-06
										Total Risk Across Direct Exposure Routes/Pathways	2.E-04
										Total Risk Across All Exposure Routes/Pathways	2.E-04

(1) COPCs shown in this table are carcinogens classifed as known (A), probable (B1, B2), possible (C), or "known/likely" under new EPA Cancer Guidelines.
(2) M indicates the Medium EPC was used while R indicates the Route EPC was used.
(3) The "Total Risk Across Direct Exposure Routes/Pathways" is the risk from the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.

TABLE 8.15.CT
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Surface and Subsurface Soil
Exposure Point: 0 to 10 foot soil
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (2)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (3)
Soil Ingestion	Tetrachloroethene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	3.14E-09	mg/kg-day	5.2E-02	$(mg/kg\text{-}day)^{-1}$	2.E-10
	Naphthalene	8.00E-01	mg/kg	8.00E-01	mg/kg	M	1.93E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Benz(a)anthracene	8.80E-01	mg/kg	8.80E-01	mg/kg	M	2.13E-08	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	2.E-08
	Benzo(a)pyrene	3.70E-01	mg/kg	3.70E-01	mg/kg	M	8.94E-09	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	7.E-08
	Benzo(b)fluoranthene	5.40E-01	mg/kg	5.40E-01	mg/kg	M	1.30E-08	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	1.E-08
	Benzo(k)fluoranthene	3.30E-01	mg/kg	3.30E-01	mg/kg	M	7.97E-09	mg/kg-day	7.3E-02	$(mg/kg\text{-}day)^{-1}$	6.E-10
	Chrysene	7.50E-01	mg/kg	7.50E-01	mg/kg	M	1.81E-08	mg/kg-day	7.3E-03	$(mg/kg\text{-}day)^{-1}$	1.E-10
	Dibenz(ah)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	5.31E-09	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	4.E-08
	Indeno(123-cd)pyrene	3.60E-01	mg/kg	3.60E-01	mg/kg	M	8.70E-09	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	6.E-09
	bis(2-Ethylhexyl)phthalate	3.40E+01	mg/kg	3.40E+01	mg/kg	M	8.21E-07	mg/kg-day	1.4E-02	$(mg/kg\text{-}day)^{-1}$	1.E-08
	Polychlorinated Biphenyls (4)	8.00E+01	mg/kg	8.00E+01	mg/kg	M	1.93E-06	mg/kg-day	1.0E+00	$(mg/kg\text{-}day)^{-1}$	2.E-06
	PCB-77	2.80E-01	mg/kg	2.80E-01	mg/kg	M	6.76E-09	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	1.E-07
	PCB-81	5.30E-02	mg/kg	5.30E-02	mg/kg	M	1.28E-09	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-08
	PCB-105	2.20E+00	mg/kg	2.20E+00	mg/kg	M	5.31E-08	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	8.E-07
	PCB-114	1.40E-01	mg/kg	1.40E-01	mg/kg	M	3.38E-09	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	3.E-07
	PCB-118	3.30E+00	mg/kg	3.30E+00	mg/kg	M	7.97E-08	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	1.E-06
	PCB-123	1.80E-01	mg/kg	1.80E-01	mg/kg	M	4.35E-09	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	7.E-08
	PCB-126	7.60E-03	mg/kg	7.60E-03	mg/kg	M	1.84E-10	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	3.E-06
	PCB-156	5.00E-02	mg/kg	5.00E-02	mg/kg	M	1.21E-09	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	9.E-08
	PCB-157	1.10E-02	mg/kg	1.10E-02	mg/kg	M	2.66E-10	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-08
	PCB-167	8.70E-02	mg/kg	8.70E-02	mg/kg	M	2.10E-09	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	3.E-09
	PCB-189	3.00E-03	mg/kg	3.00E-03	mg/kg	M	7.25E-11	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	1.E-13
	2,3,7,8-TCDD	3.00E-07	mg/kg	3.00E-07	mg/kg	M	7.25E-15	mg/kg-day	1.5E+05	$(mg/kg\text{-}day)^{-1}$	1.E-09
	1,2,3,7,8-PeCDD	1.80E-06	mg/kg	1.80E-06	mg/kg	M	4.35E-14	mg/kg-day	1.5E+05	$(mg/kg\text{-}day)^{-1}$	7.E-09
	1,2,3,4,7,8-HxCDD	2.90E-06	mg/kg	2.90E-06	mg/kg	M	7.00E-14	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	1.E-09
	1,2,3,6,7,8-HxCDD	7.70E-06	mg/kg	7.70E-06	mg/kg	M	1.86E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	3.E-09
	1,2,3,7,8,9-HxCDD	5.70E-06	mg/kg	5.70E-06	mg/kg	M	1.38E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	2.E-09
	1,2,3,4,6,7,8-HpCDD	1.30E-04	mg/kg	1.30E-04	mg/kg	M	3.14E-12	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	5.E-09
	OCDD	1.00E-03	mg/kg	1.00E-03	mg/kg	M	2.42E-11	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	4.E-10
	2,3,7,8-TCDF	2.00E-05	mg/kg	2.00E-05	mg/kg	M	4.83E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	7.E-09
	1,2,3,7,8-PeCDF	7.70E-06	mg/kg	7.70E-06	mg/kg	M	1.86E-13	mg/kg-day	7.5E+03	$(mg/kg\text{-}day)^{-1}$	1.E-09
	2,3,4,7,8-PeCDF	5.50E-05	mg/kg	5.50E-05	mg/kg	M	1.33E-12	mg/kg-day	7.5E+04	$(mg/kg\text{-}day)^{-1}$	1.E-07
	1,2,3,4,7,8-HxCDF	1.50E-05	mg/kg	1.50E-05	mg/kg	M	3.62E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	5.E-09
	1,2,3,6,7,8-HxCDF	8.80E-06	mg/kg	8.80E-06	mg/kg	M	2.13E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	3.E-09
	1,2,3,7,8,9-HxCDF	4.30E-06	mg/kg	4.30E-06	mg/kg	M	1.04E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	2.E-09
	2,3,4,6,7,8-HxCDF	1.00E-05	mg/kg	1.00E-05	mg/kg	M	2.42E-13	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	4.E-09
	1,2,3,4,6,7,8-HpCDF	3.40E-05	mg/kg	3.40E-05	mg/kg	M	8.21E-13	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	1.E-09
	1,2,3,4,7,8,9-HpCDF	3.80E-06	mg/kg	3.80E-06	mg/kg	M	9.18E-14	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	1.E-10
	OCDF	5.20E-05	mg/kg	5.20E-05	mg/kg	M	1.26E-12	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-11
	Arsenic	6.60E+00	mg/kg	6.60E+00	mg/kg	M	1.59E-07	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	2.E-07
	Beryllium	4.00E-01	mg/kg	4.00E-01	mg/kg	M	9.66E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Cadmium (Food)	1.30E+00	mg/kg	1.30E+00	mg/kg	M	3.14E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Chromium VI (particulates)	2.60E+01	mg/kg	2.60E+01	mg/kg	M	6.28E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Lead	4.90E+02	mg/kg	4.90E+02	mg/kg	M	1.18E-05	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Mercury	6.10E+00	mg/kg	6.10E+00	mg/kg	M	1.47E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	(Total)										8.E-06
										Total Risk Across Direct Exposure Routes/Pathways	2.E-05
										Total Risk Across All Exposure Routes/Pathways	2.E-05

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (2)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (3)
Soil	Tetrachloroethene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	0.00E+00	mg/kg-day	5.2E-02	$(mg/kg\text{-}day)^{-1}$	---
Dermal	Naphthalene	8.00E-01	mg/kg	8.00E-01	mg/kg	M	2.94E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Benz(a)anthracene	8.80E-01	mg/kg	8.80E-01	mg/kg	M	4.20E-09	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	3.E-09
	Benzo(a)pyrene	3.70E-01	mg/kg	3.70E-01	mg/kg	M	1.77E-09	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	1.E-08
	Benzo(b)fluoranthene	5.40E-01	mg/kg	5.40E-01	mg/kg	M	2.58E-09	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	2.E-09
	Benzo(k)fluoranthene	3.30E-01	mg/kg	3.30E-01	mg/kg	M	1.58E-09	mg/kg-day	7.3E-02	$(mg/kg\text{-}day)^{-1}$	1.E-10
	Chrysene	7.50E-01	mg/kg	7.50E-01	mg/kg	M	3.58E-09	mg/kg-day	7.3E-03	$(mg/kg\text{-}day)^{-1}$	3.E-11
	Dibenz(ah)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	1.05E-09	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	8.E-09
	Indeno(123-cd)pyrene	3.60E-01	mg/kg	3.60E-01	mg/kg	M	1.72E-09	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	1.E-09
	bis(2-Ethylhexyl)phthalate	3.40E+01	mg/kg	3.40E+01	mg/kg	M	1.62E-07	mg/kg-day	2.5E-02	$(mg/kg\text{-}day)^{-1}$	2.E-09
	Polychlorinated Biphenyls (4)	8.00E+01	mg/kg	8.00E+01	mg/kg	M	4.12E-07	mg/kg-day	1.0E+00	$(mg/kg\text{-}day)^{-1}$	4.E-07
	PCB-77	2.80E-01	mg/kg	2.80E-01	mg/kg	M	1.44E-09	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-08
	PCB-81	5.30E-02	mg/kg	5.30E-02	mg/kg	M	2.73E-10	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	4.E-09
	PCB-105	2.20E+00	mg/kg	2.20E+00	mg/kg	M	1.13E-08	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-07
	PCB-114	1.40E-01	mg/kg	1.40E-01	mg/kg	M	7.20E-10	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	5.E-08
	PCB-118	3.30E+00	mg/kg	3.30E+00	mg/kg	M	1.70E-08	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	3.E-07
	PCB-123	1.80E-01	mg/kg	1.80E-01	mg/kg	M	9.26E-10	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	1.E-08
	PCB-126	7.60E-03	mg/kg	7.60E-03	mg/kg	M	3.91E-11	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	6.E-07
	PCB-156	5.00E-02	mg/kg	5.00E-02	mg/kg	M	2.57E-10	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-08
	PCB-157	1.10E-02	mg/kg	1.10E-02	mg/kg	M	5.66E-11	mg/kg-day	7.5E+01	$(mg/kg\text{-}day)^{-1}$	4.E-09
	PCB-167	8.70E-02	mg/kg	8.70E-02	mg/kg	M	4.48E-10	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	7.E-10
	PCB-189	3.00E-03	mg/kg	3.00E-03	mg/kg	M	1.54E-11	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-10
	2,3,7,8-TCDD	3.00E-07	mg/kg	3.00E-07	mg/kg	M	3.31E-16	mg/kg-day	1.5E+05	$(mg/kg\text{-}day)^{-1}$	5.E-11
	1,2,3,7,8-PeCDD	1.80E-06	mg/kg	1.80E-06	mg/kg	M	1.98E-15	mg/kg-day	1.5E+05	$(mg/kg\text{-}day)^{-1}$	3.E-10
	1,2,3,4,7,8-HxCDD	2.90E-06	mg/kg	2.90E-06	mg/kg	M	3.20E-15	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	5.E-11
	1,2,3,6,7,8-HxCDD	7.70E-06	mg/kg	7.70E-06	mg/kg	M	8.49E-15	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	1.E-10
	1,2,3,7,8,9-HxCDD	5.70E-06	mg/kg	5.70E-06	mg/kg	M	6.28E-15	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	9.E-11
	1,2,3,4,6,7,8-HpCDD	1.30E-04	mg/kg	1.30E-04	mg/kg	M	1.43E-13	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	2.E-10
	OCDD	1.00E-03	mg/kg	1.00E-03	mg/kg	M	1.10E-12	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	2.E-11
	2,3,7,8-TCDF	2.00E-05	mg/kg	2.00E-05	mg/kg	M	2.21E-14	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	3.E-10
	1,2,3,7,8-PeCDF	7.70E-06	mg/kg	7.70E-06	mg/kg	M	8.49E-15	mg/kg-day	7.5E+03	$(mg/kg\text{-}day)^{-1}$	6.E-11
	2,3,4,7,8-PeCDF	5.50E-05	mg/kg	5.50E-05	mg/kg	M	6.06E-14	mg/kg-day	7.5E+04	$(mg/kg\text{-}day)^{-1}$	5.E-09
	1,2,3,4,7,8-HxCDF	1.50E-05	mg/kg	1.50E-05	mg/kg	M	1.65E-14	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	2.E-10
	1,2,3,6,7,8-HxCDF	8.80E-06	mg/kg	8.80E-06	mg/kg	M	9.70E-15	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	1.E-10
	1,2,3,7,8,9-HxCDF	4.30E-06	mg/kg	4.30E-06	mg/kg	M	4.74E-15	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	7.E-11
	2,3,4,6,7,8-HxCDF	1.00E-05	mg/kg	1.00E-05	mg/kg	M	1.10E-14	mg/kg-day	1.5E+04	$(mg/kg\text{-}day)^{-1}$	2.E-10
	1,2,3,4,6,7,8-HpCDF	3.40E-05	mg/kg	3.40E-05	mg/kg	M	3.75E-14	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	6.E-11
	1,2,3,4,7,8,9-HpCDF	3.80E-06	mg/kg	3.80E-06	mg/kg	M	4.19E-15	mg/kg-day	1.5E+03	$(mg/kg\text{-}day)^{-1}$	6.E-12
	OCDF	5.20E-05	mg/kg	5.20E-05	mg/kg	M	5.73E-14	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	9.E-13
	Arsenic	6.60E+00	mg/kg	6.60E+00	mg/kg	M	7.28E-09	mg/kg-day	1.6E+00	$(mg/kg\text{-}day)^{-1}$	1.E-08
	Beryllium	4.00E-01	mg/kg	4.00E-01	mg/kg	M	1.47E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Cadmium (Food)	1.30E+00	mg/kg	1.30E+00	mg/kg	M	4.78E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Chromium VI (particulates)	2.60E+01	mg/kg	2.60E+01	mg/kg	M	9.56E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Lead	4.90E+02	mg/kg	4.90E+02	mg/kg	M	1.80E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Mercury	6.10E+00	mg/kg	6.10E+00	mg/kg	M	2.24E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	(Total)										2.E-06
										Total Risk Across Direct Exposure Routes/Pathways	2.E-05
										Total Risk Across All Exposure Routes/Pathways	2.E-05

(1) COPCs shown in this table are carcinogens classifed as known (A), probable (B1, B2), possible (C), or "known/likely" under new EPA Cancer Guidelines.
(2) M indicates the Medium EPC was used while R indicates the Route EPC was used.
(3) The "Total Risk Across Direct Exposure Routes/Pathways" is the risk from the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.

TABLE 8.16.RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Excavation Site
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (2)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (3)
Ground Water Ingestion	Benzene	2.40E-01	mg/L	2.40E-01	mg/L	M	1.01E-06	mg/kg-day	2.9E-02	$(mg/kg\text{-}day)^{-1}$	3.E-08
	1,1-Dichloroethane	3.10E-01	mg/L	3.10E-01	mg/L	M	1.30E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	1,1-Dichloroethene	8.00E-03	mg/L	8.00E-03	mg/L	M	3.35E-08	mg/kg-day	6.0E-01	$(mg/kg\text{-}day)^{-1}$	2.E-08
	1,1,2,2-Tetrachloroethane	1.90E-03	mg/L	1.90E-03	mg/L	M	7.97E-09	mg/kg-day	2.0E-01	$(mg/kg\text{-}day)^{-1}$	2.E-09
	Tetrachloroethene	2.50E-02	mg/L	2.50E-02	mg/L	M	1.05E-07	mg/kg-day	5.2E-02	$(mg/kg\text{-}day)^{-1}$	5.E-09
	Trichloroethene	1.30E-02	mg/L	1.30E-02	mg/L	M	5.45E-08	mg/kg-day	1.1E-02	$(mg/kg\text{-}day)^{-1}$	6.E-10
	Vinyl Chloride	7.30E-01	mg/L	7.30E-01	mg/L	M	3.06E-06	mg/kg-day	2.5E+00	$(mg/kg\text{-}day)^{-1}$	8.E-06
	Naphthalene	1.70E-01	mg/L	1.70E-01	mg/L	M	7.13E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Arsenic	2.80E-02	mg/L	2.80E-02	mg/L	M	1.17E-07	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	2.E-07
	(Total)										8.E-06
Ground Water Dermal	Benzene	2.40E-01	mg/L	2.40E-01	mg/L	M	2.82E-04	mg/kg-day	2.9E-02	$(mg/kg\text{-}day)^{-1}$	8.E-06
	1,1-Dichloroethane	3.10E-01	mg/L	3.10E-01	mg/L	M	2.95E-05	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	1,1-Dichloroethene	8.00E-03	mg/L	8.00E-03	mg/L	M	1.37E-06	mg/kg-day	6.0E-01	$(mg/kg\text{-}day)^{-1}$	8.E-07
	1,1,2,2-Tetrachloroethane	1.90E-03	mg/L	1.90E-03	mg/L	M	1.83E-07	mg/kg-day	2.0E-01	$(mg/kg\text{-}day)^{-1}$	4.E-08
	Tetrachloroethene	2.50E-02	mg/L	2.50E-02	mg/L	M	9.87E-05	mg/kg-day	5.2E-02	$(mg/kg\text{-}day)^{-1}$	5.E-06
	Trichloroethene	1.30E-02	mg/L	1.30E-02	mg/L	M	3.19E-05	mg/kg-day	1.1E-02	$(mg/kg\text{-}day)^{-1}$	4.E-07
	Vinyl Chloride	7.30E-01	mg/L	7.30E-01	mg/L	M	5.69E-05	mg/kg-day	2.5E+00	$(mg/kg\text{-}day)^{-1}$	1.E-04
	Naphthalene	1.70E-01	mg/L	1.70E-01	mg/L	M	1.25E-04	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Arsenic	2.80E-02	mg/L	2.80E-02	mg/L	M	2.99E-07	mg/kg-day	1.6E+00	$(mg/kg\text{-}day)^{-1}$	5.E-07
	(Total)										2.E-04
										Total Risk Across Direct Exposure Routes/Pathways	2.E-04
										Total Risk Across All Exposure Routes/Pathways	2.E-04

(1) COPCs shown in this table are carcinogens classifed as known (A), probable (B1, B2), possible (C), or "known/likely" under new EPA Cancer Guidelines.
(2) M indicates the Medium EPC was used while R indicates the Route EPC was used.

TABLE 8.16.CT
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Excavation Site
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern (1)	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (2)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (3)
Ground Water Ingestion	Benzene	2.90E-02	mg/L	2.90E-02	mg/L	M	7.30E-08	mg/kg-day	2.9E-02	$(mg/kg\text{-}day)^{-1}$	2.E-09
	1,1-Dichloroethane	3.80E-02	mg/L	3.80E-02	mg/L	M	9.56E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	1,1-Dichloroethene	2.20E-03	mg/L	2.20E-03	mg/L	M	5.54E-09	mg/kg-day	6.0E-01	$(mg/kg\text{-}day)^{-1}$	3.E-09
	1,1,2,2-Tetrachloroethane	1.90E-03	mg/L	1.90E-03	mg/L	M	4.78E-09	mg/kg-day	2.0E-01	$(mg/kg\text{-}day)^{-1}$	1.E-09
	Tetrachloroethene	3.90E-03	mg/L	3.90E-03	mg/L	M	9.81E-09	mg/kg-day	5.2E-02	$(mg/kg\text{-}day)^{-1}$	5.E-10
	Trichloroethene	3.00E-03	mg/L	3.00E-03	mg/L	M	7.55E-09	mg/kg-day	1.1E-02	$(mg/kg\text{-}day)^{-1}$	8.E-11
	Vinyl Chloride	7.60E-02	mg/L	7.60E-02	mg/L	M	1.91E-07	mg/kg-day	2.5E+00	$(mg/kg\text{-}day)^{-1}$	5.E-07
	Naphthalene	3.40E-02	mg/L	3.40E-02	mg/L	M	8.55E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Arsenic	1.10E-02	mg/L	1.10E-02	mg/L	M	2.77E-08	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	4.E-08
	(Total)										5.E-07
Ground Water Dermal	Benzene	2.90E-02	mg/L	2.90E-02	mg/L	M	1.34E-05	mg/kg-day	2.9E-02	$(mg/kg\text{-}day)^{-1}$	4.E-07
	1,1-Dichloroethane	3.80E-02	mg/L	3.80E-02	mg/L	M	1.42E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	1,1-Dichloroethene	2.20E-03	mg/L	2.20E-03	mg/L	M	1.48E-07	mg/kg-day	6.0E-01	$(mg/kg\text{-}day)^{-1}$	9.E-08
	1,1,2,2-Tetrachloroethane	1.90E-03	mg/L	1.90E-03	mg/L	M	7.18E-08	mg/kg-day	2.0E-01	$(mg/kg\text{-}day)^{-1}$	1.E-08
	Tetrachloroethene	3.90E-03	mg/L	3.90E-03	mg/L	M	6.06E-06	mg/kg-day	5.2E-02	$(mg/kg\text{-}day)^{-1}$	3.E-07
	Trichloroethene	3.00E-03	mg/L	3.00E-03	mg/L	M	2.90E-06	mg/kg-day	1.1E-02	$(mg/kg\text{-}day)^{-1}$	3.E-08
	Vinyl Chloride	7.60E-02	mg/L	7.60E-02	mg/L	M	2.33E-06	mg/kg-day	2.5E+00	$(mg/kg\text{-}day)^{-1}$	6.E-06
	Naphthalene	3.40E-02	mg/L	3.40E-02	mg/L	M	9.85E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	---
	Arsenic	1.10E-02	mg/L	1.10E-02	mg/L	M	4.62E-08	mg/kg-day	1.6E+00	$(mg/kg\text{-}day)^{-1}$	7.E-08
	(Total)										7.E-06
										Total Risk Across Direct Exposure Routes/Pathways	2.E-05
										Total Risk Across All Exposure Routes/Pathways	2.E-05

(1) COPCs shown in this table are carcinogens classifed as known (A), probable (B1, B2), possible (C), or "known/likely" under new EPA Cancer Guidelines.
(2) M indicates the Medium EPC was used while R indicates the Route EPC was used.

APPENDIX P

RAGS PART D TABLE 9 SERIES:

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCS

TABLE 9.1.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

REASONABLE MAXIMUM EXPOSURE

Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation (1)	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation (1)	Dermal	Exposure Routes Total
Soil	Surface and subsurface soil	0 to 10 foot soil	Tetrachloroethene	1.E-09	---	---	1.E-09	1,2-Dichloroethene (cis)	liver	7.E-04	---	---	7.E-04
			Benz(a)anthracene	1.E-07	---	7.E-08	2.E-07	Tetrachloroethene	liver	8.E-06	---	---	8.E-06
			Benzo(a)pyrene	3.E-06	---	2.E-06	5.E-06	C9-C18 Aliphatics	liver , hematologic	7E-03	---	5E-03	1.E-02
			Benzo(b)fluoranthene	8.E-08	---	4.E-08	1.E-07	C11-C22 Aromatics	decreased body weight	1E-02	---	1E-02	2.E-02
			Benzo(k)fluoranthene	3.E-08	---	1.E-08	4.E-08	Naphthalene	decreased body weight	3E-05	---	1E-04	1.E-04
			Chrysene	1.E-09	---	6.E-10	2.E-09	bis(2-Ethylhexyl)phthalate	liver	1.E-03	---	6.E-04	2.E-03
			Dibenz(ah)anthracene	3.E-07	---	2.E-07	5.E-07	Polychlorinated Biphenyls	immune	3.E+00	---	2.E+00	5.E+00
			Indeno(123-cd)pyrene	6.E-08	---	3.E-08	9.E-08	Antimony	longevity, blood glucose, cholesterol	1.E-03	---	5.E-04	2.E-03
			bis(2-Ethylhexyl)phthalate	1.E-07	---	5.E-08	2.E-07	Arsenic	skin, circulatory	1.E-02	---	2.E-03	2.E-02
			Polychlorinated Biphenyls	3.E-05	---	2.E-05	5.E-05	Barium	kidney	7.E-04	---	6.E-04	1.E-03
			PCB-77	1.E-05	---	5.E-06	2.E-05	Beryllium	gastrointestinal	6.E-04	---	2.E-03	3.E-03
			PCB-81	2.E-07	---	1.E-07	3.E-07	Cadmium (Food)	kidney	3.E-02	---	4.E-02	7.E-02
			PCB-105	7.E-06	---	4.E-06	1.E-05	Chromium VI (particulates)	no observed effect	1.E-01	---	4.E-01	6.E-01
			PCB-114	2.E-06	---	1.E-06	4.E-06	Copper	gastrointestinal	7.E-04	---	6.E-05	8.E-04
			PCB-118	1.E-05	---	6.E-06	2.E-05	Manganese	central nervous	1.E-02	---	8.E-03	2.E-02
			PCB-123	6.E-07	---	3.E-07	9.E-07	Mercury	central nervous	2.E-01	---	9.E-02	2.E-01
			PCB-126	2.E-05	---	1.E-05	4.E-05	Molybdenum	kidney	1.E-02	---	5.E-04	1.E-02
			PCB-156	8.E-07	---	4.E-07	1.E-06	Nickel	decreased body and organ weights	3.E-02	---	1.E-01	1.E-01
			PCB-157	2.E-07	---	1.E-07	3.E-07	Vanadium	decreased hair cystine	2.E-03	---	3.E-03	5.E-03
			PCB-167	3.E-08	---	2.E-08	4.E-08	Zinc	decrease in ESOD	3.E-04	---	4.E-05	3.E-04
			PCB-189	1.E-08	---	5.E-09	2.E-08	(Total)		3.E+00	---	2.E+00	6.E+00
			2,3,7,8-TCDD	1.E-08	---	2.E-09	1.E-08						
			1,2,3,7,8-PeCDD	1.E-07	---	1.E-08	1.E-07						
			1,2,3,4,7,8-HxCDD	2.E-08	---	2.E-09	2.E-08						
			1,2,3,6,7,8-HxCDD	4.E-08	---	5.E-09	4.E-08						
			1,2,3,7,8,9-HxCDD	3.E-08	---	4.E-09	4.E-08						
			1,2,3,4,6,7,8-HpCDD	8.E-08	---	1.E-08	9.E-08						
			OCDD	6.E-09	---	8.E-10	7.E-09						
			2,3,7,8-TCDF	2.E-07	---	2.E-08	2.E-07						
			1,2,3,7,8-PeCDF	4.E-08	---	4.E-09	4.E-08						
			2,3,4,7,8-PeCDF	2.E-06	---	3.E-07	3.E-06						
			1,2,3,4,7,8-HxCDF	1.E-07	---	1.E-08	1.E-07						
			1,2,3,6,7,8-HxCDF	6.E-08	---	7.E-09	7.E-08						
			1,2,3,7,8,9-HxCDF	4.E-08	---	4.E-09	4.E-08						
			2,3,4,6,7,8-HxCDF	7.E-08	---	8.E-09	8.E-08						
			1,2,3,4,6,7,8-HpCDF	2.E-08	---	2.E-09	2.E-08						
			1,2,3,4,7,8,9-HpCDF	3.E-09	---	3.E-10	3.E-09						
			OCDF	3.E-10	---	4.E-11	4.E-10						
			Arsenic	2.E-06	---	3.E-07	2.E-06						
			(Total)	1.E-04	---	5.E-05	2.E-04						

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk			
				Ingestion	Inhalation (1)	Dermal	Exposure Routes Total
Groundwater	Groundwater	Tapwater	Benzene	7.E-05	---	7.E-05	1.E-04
			Chloromethane	6.E-07	---	2.E-08	6.E-07
			1,2-Dichloroethane	2.E-05	---	7.E-07	2.E-05
			1,1-Dichloroethene	7.E-05	---	1.E-05	8.E-05
			Methylene Chloride	1.E-04	---	5.E-06	1.E-04
			1,1,2,2-Tetrachloroethane	4.E-06	---	3.E-07	4.E-06
			Tetrachloroethene	1.E-05	---	4.E-05	5.E-05
			Trichloroethene	9.E-05	---	2.E-04	3.E-04
			Vinyl Chloride	2.E-02	---	1.E-03	2.E-02
			Aldrin	8.E-06	---	1.E-07	8.E-06
			alpha-BHC	2.E-06	---	3.E-06	4.E-06
			gamma-BHC (Lindane)	9.E-07	---	2.E-06	3.E-06
			Dieldrin	7.E-06	---	1.E-06	8.E-06
			Heptachlor	2.E-06	---	2.E-07	2.E-06
			Heptachlor Epoxide	2.E-06	---	2.E-07	2.E-06
			Arsenic	4.E-04	---	4.E-06	4.E-04
			(Total)	2.E-02	---	1.E-03	2.E-02

Chemical	Non-Carcinogenic Hazard Quotient				
	Primary Target Organ	Ingestion	Inhalation (1)	Dermal	Exposure Routes Total
Benzene	hematologic	7.E+00	---	7.E+00	1.E+01
Chloroethane	reproductive	2.E-02	---	1.E-03	2.E-02
Chloromethane	central nervous	3.E-02	---	1.E-03	4.E-02
1,1-Dichloroethane	no observed effect	3.E-01	---	2.E-02	3.E-01
1,1-Dichloroethene	liver	4.E-02	---	5.E-03	4.E-02
1,2-Dichloroethene (cis)	liver	7.E+00	---	6.E-01	7.E+00
1,2-Dichloroethene (trans)	liver	1.E-01	---	1.E-02	1.E-01
Ethylbenzene	liver, kidney	3.E-01	---	2.E+00	3.E+00
Methylene Chloride	liver	9.E-01	---	4.E-02	9.E-01
Tetrachloroethene	liver	7.E-02	---	2.E-01	3.E-01
Toluene	liver, kidney	8.E-02	---	7.E-01	8.E-01
1,1,1-Trichloroethane	central nervous	9.E-01	---	1.E-01	1.E+00
Vinyl Chloride	liver	4.E+00	---	3.E-01	4.E+00
C9-C10 Aromatics	decreased body weight	5.E-01	---	3.E-01	9.E-01
C11-C22 Aromatics	decreased body weight	2.E-01	---	2.E+00	2.E+00
2-Methylnaphthalene	decreased body weight	5.E-02	---	3.E-02	8.E-02
Naphthalene	decreased body weight	3.E-01	---	2.E-01	5.E-01
1,2-Dichlorobenzene	no observed effect	7.E-03	---	4.E-03	1.E-02
Aldrin	liver	4.E-02	---	6.E-04	4.E-02
gamma-BHC (Lindane)	liver, kidney	7.E-03	---	1.E-02	2.E-02
Dieldrin	liver	3.E-02	---	4.E-03	3.E-02
Heptachlor	liver	2.E-03	---	2.E-04	2.E-03
Heptachlor Epoxide	liver	4.E-02	---	4.E-03	5.E-02
Antimony	longevity, blood glucose, cholesterol	5.E-01	---	4.E-02	5.E-01
Arsenic	skin, circulatory	3.E+00	---	2.E-02	3.E+00
Barium	kidney	2.E-01	---	3.E-02	2.E-01
Cadmium (Water)	kidney	4.E-01	---	8.E-02	5.E-01
Chromium VI (aerosols)	no observed effect	6.E-01	---	1.E+00	2.E+00
Manganese	central nervous	7.E+00	---	1.E+00	9.E+00
Nitrate	circulatory	1.E-01	---	9.E-04	1.E-01
Selenium	clinical selenosis	1.E-01	---	1.E-03	1.E-01
(Total)		3.E+01	---	2.E+01	5.E+01

Total Risk Across Soil	2E-04
Total Risk Across Groundwater	2E-02
(2) Total Risk Across All Media and Direct Exposure Routes	2E-02
(3) Total Risk Across All Media and All Exposure Routes	4.E-02

(4) Total Hazard Index Across All Media and Direct Exposure Routes	6.E+01
(5) Total Hazard Index Across All Media and All Exposure Routes	8.E+01

(6) Total Hazard Index Divided by Target Organ

$HI_{hematologic}$	2.E+01	HI_{immune}	1.E+01
$HI_{reproductive}$	7.E+00	$HI_{gastrointestinal}$	7.E+00
$HI_{central\ nervous}$	2.E+01	HI_{skin}	1.E+01
HI_{kidney}	1.E+01	HI_{liver}	2.E+01
$HI_{circulatory}$	1.E+01		

(1) Risk from soil dust and vapor inhalation is based on modeled EPCs (see equations and text in section 3.3.6) and calculations of dose as shown in sections 3.4.6 and 3.4.7 of the Baseline Risk Assessment report.

Following USEPA Guidance, we assume that the hazard and risk from indoor inhalation of VOCs in groundwater are equal to the hazard and risk estimated for ingestion of VOCs in groundwater (USEPA Region 1 Risk Update, 1995).

(2) The "Total Risk Across All Media and Direct Exposure Routes" is the risk from the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.

(3) The "Total Risk Across All Media and All Exposure Routes" is the risk from the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.

(4) The "Total Hazard Index Across All Media and Direct Exposure Routes" is the HI for the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.

(5) The "Total Hazard Index Across All Media and All Exposure Routes" is the HI for the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.

(6) The "Total Hazard Index Across All Media and Direct Exposure Routes" is divided based on the primary target organ for each COC (see Table 16 of the Baseline Risk Assessment report).

Each COC may affect more than one target organ, thus the sum of the hazard indices by target organ does not equal the total hazard index.

TABLE 9.1.CT

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

CENTRAL TENDENCY

Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation (1)	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation (1)	Dermal	Exposure Routes Total
Soil	Surface and subsurface soil	0 to 10 foot soil	Tetrachloroethene	2.E-10	---	---	2.E-10	1,2-Dichloroethene (cis)	liver	6.E-06	---	---	6.E-06
			Benz(a)anthracene	2.E-08	---	3.E-09	2.E-08	Tetrachloroethene	liver	4.E-06	---	---	4.E-06
			Benzo(a)pyrene	8.E-08	---	1.E-08	1.E-07	C9-C18 Aliphatics	liver , hematologic	3E-03	---	8E-04	4.E-03
			Benzo(b)fluoranthene	1.E-08	---	2.E-09	1.E-08	C11-C22 Aromatics	decreased body weight	7E-03	---	1E-03	8.E-03
			Benzo(k)fluoranthene	8.E-10	---	1.E-10	9.E-10	Naphthalene	decreased body weight	1E-05	---	1E-05	3.E-05
			Chrysene	2.E-10	---	3.E-11	2.E-10	bis(2-Ethylhexyl)phthalate	liver	5.E-04	---	8.E-05	6.E-04
			Dibenz(ah)anthracene	5.E-08	---	7.E-09	6.E-08	Polychlorinated Biphenyls	immune	2.E+00	---	2.E-01	2.E+00
			Indeno(123-cd)pyrene	8.E-09	---	1.E-09	9.E-09	Antimony	longevity, blood glucose, cholesterol	6.E-04	---	7.E-05	6.E-04
			bis(2-Ethylhexyl)phthalate	1.E-08	---	2.E-09	2.E-08	Arsenic	skin, circulatory	7.E-03	---	2.E-04	7.E-03
			Polychlorinated Biphenyls	3.E-06	---	4.E-07	3.E-06	Barium	kidney	3.E-04	---	8.E-05	4.E-04
			PCB-77	1.E-07	---	2.E-08	2.E-07	Beryllium	gastrointestinal	6.E-05	---	7.E-05	1.E-04
			PCB-81	2.E-08	---	4.E-09	3.E-08	Cadmium (Food)	kidney	4.E-04	---	2.E-04	6.E-04
			PCB-105	1.E-06	---	2.E-07	1.E-06	Chromium VI (particulates)	no observed effect	3.E-03	---	3.E-03	6.E-03
			PCB-114	3.E-07	---	5.E-08	4.E-07	Copper	gastrointestinal	4.E-04	---	8.E-06	4.E-04
			PCB-118	2.E-06	---	2.E-07	2.E-06	Manganese	central nervous	7.E-04	---	2.E-04	9.E-04
			PCB-123	8.E-08	---	1.E-08	1.E-07	Mercury	central nervous	2.E-02	---	3.E-03	2.E-02
			PCB-126	4.E-06	---	6.E-07	4.E-06	Molybdenum	kidney	2.E-04	---	2.E-06	2.E-04
			PCB-156	1.E-07	---	2.E-08	1.E-07	Nickel	decreased body and organ weights	4.E-04	---	4.E-04	8.E-04
			PCB-157	3.E-08	---	4.E-09	3.E-08	Vanadium	decreased hair cystine	8.E-04	---	5.E-04	1.E-03
			PCB-167	4.E-09	---	7.E-10	5.E-09	Zinc	decrease in ESOD	1.E-04	---	6.E-06	1.E-04
			PCB-189	1.E-09	---	2.E-10	2.E-09	(Total)		2.E+00	---	3.E-01	2.E+00
			2,3,7,8-TCDD	1.E-09	---	5.E-11	1.E-09						
			1,2,3,7,8-PeCDD	8.E-09	---	3.E-10	9.E-09						
			1,2,3,4,7,8-HxCDD	1.E-09	---	5.E-11	1.E-09						
			1,2,3,6,7,8-HxCDD	4.E-09	---	1.E-10	4.E-09						
			1,2,3,7,8,9-HxCDD	3.E-09	---	9.E-11	3.E-09						
			1,2,3,4,6,7,8-HpCDD	6.E-09	---	2.E-10	6.E-09						
			OCDD	5.E-10	---	2.E-11	5.E-10						
			2,3,7,8-TCDF	9.E-09	---	3.E-10	1.E-08						
			1,2,3,7,8-PeCDF	2.E-09	---	6.E-11	2.E-09						
			2,3,4,7,8-PeCDF	1.E-07	---	4.E-09	1.E-07						
			1,2,3,4,7,8-HxCDF	7.E-09	---	2.E-10	7.E-09						
			1,2,3,6,7,8-HxCDF	4.E-09	---	1.E-10	4.E-09						
			1,2,3,7,8,9-HxCDF	2.E-09	---	7.E-11	2.E-09						
			2,3,4,6,7,8-HxCDF	5.E-09	---	2.E-10	5.E-09						
			1,2,3,4,6,7,8-HpCDF	2.E-09	---	5.E-11	2.E-09						
			1,2,3,4,7,8,9-HpCDF	2.E-10	---	6.E-12	2.E-10						
			OCDF	2.E-11	---	8.E-13	3.E-11						
			Arsenic	3.E-07	---	1.E-08	3.E-07						
			(Total)	1.E-05	---	2.E-06	1.E-05						

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation (1)	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation (1)	Dermal	Exposure Routes Total
Groundwater	Groundwater	Tapwater	Benzene	6.E-07	---	3.E-07	9.E-07	Benzene	hematologic	2.E-01	---	1.E-01	3.E-01
			Chloromethane	4.E-08	---	7.E-10	4.E-08	Chloroethane	reproductive	3.E-04	---	1.E-05	3.E-04
			1,2-Dichloroethane	3.E-07	---	8.E-09	4.E-07	Chloromethane	central nervous	7.E-03	---	1.E-04	7.E-03
			1,1-Dichloroethene	2.E-06	---	1.E-07	2.E-06	1,1-Dichloroethane	no observed effect	5.E-03	---	2.E-04	6.E-03
			Methylene Chloride	4.E-07	---	7.E-09	4.E-07	1,1-Dichloroethene	liver	4.E-03	---	2.E-04	4.E-03
			1,1,2,2-Tetrachloroethane	6.E-07	---	2.E-08	6.E-07	1,2-Dichloroethene (cis)	liver	2.E-01	---	1.E-02	3.E-01
			Tetrachloroethene	3.E-07	---	5.E-07	9.E-07	1,2-Dichloroethene (trans)	liver	4.E-03	---	2.E-04	4.E-03
			Trichloroethene	5.E-07	---	5.E-07	9.E-07	Ethylbenzene	liver, kidney	5.E-03	---	2.E-02	3.E-02
			Vinyl Chloride	8.E-05	---	3.E-06	8.E-05	Methylene Chloride	liver	8.E-03	---	2.E-04	8.E-03
			Aldrin	5.E-07	---	3.E-09	5.E-07	Tetrachloroethene	liver	7.E-03	---	1.E-02	2.E-02
			alpha-BHC	9.E-08	---	8.E-08	2.E-07	Toluene	liver, kidney	3.E-03	---	1.E-02	2.E-02
			gamma-BHC (Lindane)	4.E-08	---	4.E-08	8.E-08	1,1,1-Trichloroethane	central nervous	3.E-02	---	2.E-03	4.E-02
			Dieldrin	4.E-07	---	3.E-08	4.E-07	Vinyl Chloride	liver	7.E-02	---	2.E-03	7.E-02
			Heptachlor	8.E-08	---	4.E-09	8.E-08	C9-C10 Aromatics	decreased body weight	1.E-01	---	3.E-02	1.E-01
			Heptachlor Epoxide	1.E-07	---	5.E-09	1.E-07	C11-C22 Aromatics	decreased body weight	4.E-02	---	2.E-01	3.E-01
			Arsenic	3.E-05	---	1.E-07	3.E-05	2-Methylnaphthalene	decreased body weight	1.E-02	---	3.E-03	1.E-02
			(Total)	1.E-04	---	4.E-06	1.E-04	Naphthalene	decreased body weight	2.E-02	---	5.E-03	2.E-02
								1,2-Dichlorobenzene	no observed effect	5.E-04	---	1.E-04	6.E-04
								Aldrin	liver	1.E-02	---	7.E-05	1.E-02
								gamma-BHC (Lindane)	liver, kidney	1.E-03	---	9.E-04	2.E-03
								Dieldrin	liver	5.E-03	---	3.E-04	5.E-03
								Heptachlor	liver	4.E-04	---	2.E-05	4.E-04
								Heptachlor Epoxide	liver	9.E-03	---	4.E-04	9.E-03
								Antimony	longevity, blood glucose, cholesterol	1.E-01	---	6.E-03	2.E-01
								Arsenic	skin, circulatory	7.E-01	---	3.E-03	7.E-01
								Barium	kidney	3.E-02	---	2.E-03	3.E-02
								Cadmium (Water)	kidney	2.E-02	---	2.E-03	3.E-02
								Chromium VI (aerosols)	no observed effect	8.E-02	---	7.E-02	1.E-01
								Manganese	central nervous	2.E+00	---	1.E-01	2.E+00
								Nitrate	circulatory	3.E-03	---	1.E-05	3.E-03
								Selenium	clinical selenosis	2.E-02	---	1.E-04	2.E-02
								(Total)		3.E+00	---	6.E-01	4.E+00

Total Risk Across Soil	1E-05
Total Risk Across Groundwater	1E-04
(3) Total Risk Across All Media and All Exposure Routes	2.E-04
(2) Total Risk Across All Media and Direct Exposure Routes	1E-04

(4) Total Hazard Index Across All Media and Direct Exposure Routes	6.E+00
(5) Total Hazard Index Across All Media and All Exposure Routes	7.E+00

(6) Total Hazard Index Divided by Target Organ

$HI_{hematologic}$	1.E+00	HI_{immune}	3.E+00
$HI_{reproductive}$	8.E-01	$HI_{gastrointestinal}$	8.E-01
$HI_{central\ nervous}$	3.E+00	HI_{skin}	1.E+00
HI_{kidney}	9.E-01	HI_{liver}	1.E+00
$HI_{circulatory}$	1.E+00		

(1) Risk from soil dust and vapor inhalation is based on modeled EPCs (see equations and text in section 3.3.6) and calculations of dose as shown in sections 3.4.6 and 3.4.7 of the Baseline Risk Assessment report.

Following USEPA Guidance, we assume that the hazard and risk from indoor inhalation of VOCs in groundwater are equal to the hazard and risk estimated for ingestion of VOCs in groundwater (USEPA Region 1 Risk Update, 1995).

(2) The "Total Risk Across All Media and Direct Exposure Routes" is the risk from the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.

(3) The "Total Risk Across All Media and All Exposure Routes" is the risk from the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.

(4) The "Total Hazard Index Across All Media and Direct Exposure Routes" is the HI for the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.

(5) The "Total Hazard Index Across All Media and All Exposure Routes" is the HI for the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.

(6) The "Total Hazard Index Across All Media and Direct Exposure Routes" is divided based on the primary target organ for each COC (see Table 16 of the Baseline Risk Assessment report).

Each COC may affect more than one target organ, thus the sum of the hazard indices by target organ does not equal the total hazard index.

TABLE 9.2.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

REASONABLE MAXIMUM EXPOSURE

Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation (1)	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation (1)	Dermal	Exposure Routes Total
Soil	Surface and subsurface soil	0 to 10 foot soil	Tetrachloroethene	3.E-09	---	---	3.E-09	1,2-Dichloroethene (cis)	liver	6.E-03	---	---	6.E-03
			Benz(a)anthracene	3.E-07	---	1.E-07	4.E-07	Tetrachloroethene	liver	8.E-05	---	---	8.E-05
			Benzo(a)pyrene	7.E-06	---	3.E-06	1.E-05	C9-C18 Aliphatics	liver , hematologic	6E-02	---	4E-02	1.E-01
			Benzo(b)fluoranthene	2.E-07	---	7.E-08	3.E-07	C11-C22 Aromatics	decreased body weight	1E-01	---	7E-02	2.E-01
			Benzo(k)fluoranthene	6.E-08	---	2.E-08	9.E-08	Naphthalene	decreased body weight	2E-04	---	7E-04	9.E-04
			Chrysene	3.E-09	---	1.E-09	4.E-09	bis(2-Ethylhexyl)phthalate	liver	1.E-02	---	4.E-03	1.E-02
			Dibenz(ah)anthracene	8.E-07	---	3.E-07	1.E-06	Polychlorinated Biphenyls	immune	3.E+01	---	1.E+01	4.E+01
			Indeno(123-cd)pyrene	1.E-07	---	5.E-08	2.E-07	Antimony	longevity, blood glucose, cholesterol	1.E-02	---	3.E-03	1.E-02
			bis(2-Ethylhexyl)phthalate	2.E-07	---	9.E-08	3.E-07	Arsenic	skin, circulatory	1.E-01	---	1.E-02	1.E-01
			Polychlorinated Biphenyls	8.E-05	---	3.E-05	1.E-04	Barium	kidney	7.E-03	---	4.E-03	1.E-02
			PCB-77	2.E-05	---	9.E-06	3.E-05	Beryllium	gastrointestinal	5.E-03	---	2.E-02	2.E-02
			PCB-81	4.E-07	---	2.E-07	6.E-07	Cadmium (Food)	kidney	3.E-01	---	3.E-01	6.E-01
			PCB-105	2.E-05	---	7.E-06	2.E-05	Chromium VI (particulates)	no observed effect	1.E+00	---	3.E+00	4.E+00
			PCB-114	5.E-06	---	2.E-06	7.E-06	Copper	gastrointestinal	7.E-03	---	4.E-04	7.E-03
			PCB-118	2.E-05	---	1.E-05	3.E-05	Manganese	central nervous	9.E-02	---	5.E-02	1.E-01
			PCB-123	1.E-06	---	5.E-07	2.E-06	Mercury	central nervous	1.E+00	---	6.E-01	2.E+00
			PCB-126	6.E-05	---	2.E-05	8.E-05	Molybdenum	kidney	1.E-01	---	3.E-03	1.E-01
			PCB-156	2.E-06	---	8.E-07	3.E-06	Nickel	decreased body and organ weights	3.E-01	---	8.E-01	1.E+00
			PCB-157	4.E-07	---	2.E-07	6.E-07	Vanadium	decreased hair cystine	2.E-02	---	2.E-02	4.E-02
			PCB-167	7.E-08	---	3.E-08	9.E-08	Zinc	decrease in ESOD	3.E-03	---	3.E-04	3.E-03
			PCB-189	2.E-12	---	9.E-09	9.E-09	(Total)		3.E+01	---	2.E+01	5.E+01
			2,3,7,8-TCDD	3.E-08	---	3.E-09	3.E-08						
			1,2,3,7,8-PeCDD	3.E-07	---	2.E-08	3.E-07						
			1,2,3,4,7,8-HxCDD	4.E-08	---	3.E-09	4.E-08						
			1,2,3,6,7,8-HxCDD	9.E-08	---	8.E-09	1.E-07						
			1,2,3,7,8,9-HxCDD	8.E-08	---	7.E-09	8.E-08						
			1,2,3,4,6,7,8-HpCDD	2.E-07	---	2.E-08	2.E-07						
			OCDD	2.E-08	---	1.E-09	2.E-08						
			2,3,7,8-TCDF	4.E-07	---	4.E-08	5.E-07						
			1,2,3,7,8-PeCDF	8.E-08	---	7.E-09	9.E-08						
			2,3,4,7,8-PeCDF	5.E-06	---	5.E-07	6.E-06						
			1,2,3,4,7,8-HxCDF	2.E-07	---	2.E-08	3.E-07						
			1,2,3,6,7,8-HxCDF	1.E-07	---	1.E-08	2.E-07						
			1,2,3,7,8,9-HxCDF	8.E-08	---	7.E-09	9.E-08						
			2,3,4,6,7,8-HxCDF	2.E-07	---	1.E-08	2.E-07						
			1,2,3,4,6,7,8-HpCDF	5.E-08	---	4.E-09	5.E-08						
			1,2,3,4,7,8,9-HpCDF	6.E-09	---	5.E-10	6.E-09						
			OCDF	8.E-10	---	7.E-11	8.E-10						
			Arsenic	5.E-06	---	5.E-07	5.E-06						
			(Total)	2.E-04	---	9.E-05	3.E-04						

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk			
				Ingestion	Inhalation (1)	Dermal	Exposure Routes Total
Groundwater	Groundwater	Tapwater	Benzene	6.E-05	---	3.E-05	9.E-05
			Chloromethane	5.E-07	---	1.E-08	5.E-07
			1,2-Dichloroethane	1.E-05	---	3.E-07	1.E-05
			1,1-Dichloroethene	6.E-05	---	4.E-06	6.E-05
			Methylene Chloride	1.E-04	---	2.E-06	1.E-04
			1,1,2,2-Tetrachloroethane	3.E-06	---	1.E-07	3.E-06
			Tetrachloroethene	1.E-05	---	2.E-05	3.E-05
			Trichloroethene	8.E-05	---	8.E-05	2.E-04
			Vinyl Chloride	2.E-02	---	5.E-04	2.E-02
			Aldrin	7.E-06	---	5.E-08	7.E-06
			alpha-BHC	1.E-06	---	1.E-06	3.E-06
			gamma-BHC (Lindane)	8.E-07	---	8.E-07	2.E-06
			Dieldrin	6.E-06	---	5.E-07	7.E-06
			Heptachlor	2.E-06	---	8.E-08	2.E-06
			Heptachlor Epoxide	1.E-06	---	8.E-08	2.E-06
			Arsenic	3.E-04	---	2.E-06	3.E-04
			(Total)	2.E-02	---	6.E-04	2.E-02

Chemical	Non-Carcinogenic Hazard Quotient				
	Primary Target Organ	Ingestion	Inhalation (1)	Dermal	Exposure Routes Total
Benzene	hematologic	2.E+01	---	1.E+01	3.E+01
Chloroethane	reproductive	6.E-02	---	2.E-03	6.E-02
Chloromethane	central nervous	1.E-01	---	2.E-03	1.E-01
1,1-Dichloroethane	no observed effect	1.E+00	---	4.E-02	1.E+00
1,1-Dichloroethene	liver	1.E-01	---	9.E-03	1.E-01
1,2-Dichloroethene (cis)	liver	2.E+01	---	1.E+00	3.E+01
1,2-Dichloroethene (trans)	liver	5.E-01	---	2.E-02	5.E-01
Ethylbenzene	liver, kidney	9.E-01	---	4.E+00	5.E+00
Methylene Chloride	liver	3.E+00	---	6.E-02	3.E+00
Tetrachloroethene	liver	2.E-01	---	4.E-01	6.E-01
Toluene	liver, kidney	3.E-01	---	1.E+00	1.E+00
1,1,1-Trichloroethane	central nervous	3.E+00	---	2.E-01	3.E+00
Vinyl Chloride	liver	1.E+01	---	5.E-01	1.E+01
C9-C10 Aromatics	decreased body weight	2.E+00	---	6.E-01	2.E+00
C11-C22 Aromatics	decreased body weight	7.E-01	---	4.E+00	5.E+00
2-Methylnaphthalene	decreased body weight	2.E-01	---	6.E-02	2.E-01
Naphthalene	decreased body weight	1.E+00	---	3.E-01	1.E+00
1,2-Dichlorobenzene	no observed effect	2.E-02	---	7.E-03	3.E-02
Aldrin	liver	2.E-01	---	1.E-03	2.E-01
gamma-BHC (Lindane)	liver, kidney	2.E-02	---	2.E-02	5.E-02
Dieldrin	liver	9.E-02	---	7.E-03	1.E-01
Heptachlor	liver	8.E-03	---	4.E-04	8.E-03
Heptachlor Epoxide	liver	1.E-01	---	7.E-03	2.E-01
Antimony	longevity, blood glucose, cholesterol	2.E+00	---	8.E-02	2.E+00
Arsenic	skin, circulatory	9.E+00	---	4.E-02	9.E+00
Barium	kidney	6.E-01	---	6.E-02	7.E-01
Cadmium (Water)	kidney	2.E+00	---	1.E-01	2.E+00
Chromium VI (aerosols)	no observed effect	2.E+00	---	2.E+00	4.E+00
Manganese	central nervous	3.E+01	---	2.E+00	3.E+01
Nitrate	circulatory	4.E-01	---	2.E-03	4.E-01
Selenium	clinical selenosis	4.E-01	---	2.E-03	4.E-01
(Total)		1.E+02	---	3.E+01	1.E+02

Total Risk Across Soil	3E-04
Total Risk Across Groundwater	2E-02
(2) Total Risk Across All Media and Direct Exposure Routes	2.E-02
(3) Total Risk Across All Media and All Exposure Routes	3.E-02

(4) Total Hazard Index Across All Media and Direct Exposure Routes	2.E+02
(5) Total Hazard Index Across All Media and All Exposure Routes	3.E+02

(6) Total Hazard Index Divided by Target Organ

$HI_{hematologic}$	6.E+01	HI_{immune}	6.E+01
$HI_{reproductive}$	2.E+01	$HI_{gastrointestinal}$	2.E+01
$HI_{central\ nervous}$	5.E+01	HI_{skin}	3.E+01
HI_{kidney}	4.E+01	HI_{liver}	7.E+01
$HI_{circulatory}$	3.E+01		

(1) Risk from soil dust and vapor inhalation is based on modeled EPCs (see equations and text in section 3.3.6) and calculations of dose as shown in sections 3.4.6 and 3.4.7 of the Baseline Risk Assessment report.

Following USEPA Guidance, we assume that the hazard and risk from indoor inhalation of VOCs in groundwater are equal to the hazard and risk estimated for ingestion of VOCs in groundwater (USEPA Region 1 Risk Update, 1995).

(2) The "Total Risk Across All Media and Direct Exposure Routes" is the risk from the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.

(3) The "Total Risk Across All Media and All Exposure Routes" is the risk from the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.

(4) The "Total Hazard Index Across All Media and Direct Exposure Routes" is the HI for the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.

(5) The "Total Hazard Index Across All Media and All Exposure Routes" is the HI for the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.

(6) The "Total Hazard Index Across All Media and Direct Exposure Routes" is divided based on the primary target organ for each COC (see Table 16 of the Baseline Risk Assessment report).

Each COC may affect more than one target organ, thus the sum of the hazard indices by target organ does not equal the total hazard index.

TABLE 9.2.CT

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

CENTRAL TENDENCY

Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation (1)	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation (1)	Dermal	Exposure Routes Total
Soil	Surface and subsurface soil	0 to 10 foot soil	Tetrachloroethene	6.E-10	---	---	6.E-10	1,2-Dichloroethene (cis)	liver	5.E-05	---	---	5.E-05
			Benz(a)anthracene	5.E-08	---	1.E-08	7.E-08	Tetrachloroethene	liver	4.E-05	---	---	4.E-05
			Benzo(a)pyrene	2.E-07	---	5.E-08	3.E-07	C9-C18 Aliphatics	liver , hematologic	3E-02	---	1E-02	4.E-02
			Benzo(b)fluoranthene	3.E-08	---	7.E-09	4.E-08	C11-C22 Aromatics	decreased body weight	6E-02	---	2E-02	8.E-02
			Benzo(k)fluoranthene	2.E-09	---	5.E-10	2.E-09	Naphthalene	decreased body weight	1E-04	---	2E-04	3.E-04
			Chrysene	5.E-10	---	1.E-10	6.E-10	bis(2-Ethylhexyl)phthalate	liver	5.E-03	---	1.E-03	6.E-03
			Dibenz(ah)anthracene	1.E-07	---	3.E-08	2.E-07	Polychlorinated Biphenyls	immune	1.E+01	---	3.E+00	2.E+01
			Indeno(123-cd)pyrene	2.E-08	---	5.E-09	3.E-08	Antimony	longevity, blood glucose, cholesterol	5.E-03	---	9.E-04	6.E-03
			bis(2-Ethylhexyl)phthalate	4.E-08	---	9.E-09	5.E-08	Arsenic	skin, circulatory	6.E-02	---	4.E-03	7.E-02
			Polychlorinated Biphenyls	7.E-06	---	2.E-06	8.E-06	Barium	kidney	3.E-03	---	1.E-03	4.E-03
			PCB-77	4.E-07	---	9.E-08	4.E-07	Beryllium	gastrointestinal	6.E-04	---	1.E-03	2.E-03
			PCB-81	7.E-08	---	2.E-08	8.E-08	Cadmium (Food)	kidney	4.E-03	---	3.E-03	6.E-03
			PCB-105	3.E-06	---	7.E-07	3.E-06	Chromium VI (particulates)	no observed effect	3.E-02	---	4.E-02	7.E-02
			PCB-114	9.E-07	---	2.E-07	1.E-06	Copper	gastrointestinal	3.E-03	---	1.E-04	4.E-03
			PCB-118	4.E-06	---	1.E-06	5.E-06	Manganese	central nervous	7.E-03	---	2.E-03	9.E-03
			PCB-123	2.E-07	---	5.E-08	3.E-07	Mercury	central nervous	2.E-01	---	4.E-02	2.E-01
			PCB-126	1.E-05	---	2.E-06	1.E-05	Molybdenum	kidney	1.E-03	---	2.E-05	1.E-03
			PCB-156	3.E-07	---	8.E-08	4.E-07	Nickel	decreased body and organ weights	3.E-03	---	6.E-03	9.E-03
			PCB-157	7.E-08	---	2.E-08	9.E-08	Vanadium	decreased hair cystine	8.E-03	---	7.E-03	1.E-02
			PCB-167	1.E-08	---	3.E-09	1.E-08	Zinc	decrease in ESOD	1.E-03	---	9.E-05	1.E-03
			PCB-189	4.E-13	---	9.E-10	9.E-10	(Total)		1.E+01	---	4.E+00	2.E+01
			2,3,7,8-TCDD	4.E-09	---	2.E-10	4.E-09						
			1,2,3,7,8-PeCDD	2.E-08	---	1.E-09	2.E-08						
			1,2,3,4,7,8-HxCDD	4.E-09	---	2.E-10	4.E-09						
			1,2,3,6,7,8-HxCDD	1.E-08	---	5.E-10	1.E-08						
			1,2,3,7,8,9-HxCDD	7.E-09	---	4.E-10	8.E-09						
			1,2,3,4,6,7,8-HpCDD	2.E-08	---	8.E-10	2.E-08						
			OCDD	1.E-09	---	7.E-11	1.E-09						
			2,3,7,8-TCDF	3.E-08	---	1.E-09	3.E-08						
			1,2,3,7,8-PeCDF	5.E-09	---	3.E-10	5.E-09						
			2,3,4,7,8-PeCDF	3.E-07	---	2.E-08	4.E-07						
			1,2,3,4,7,8-HxCDF	2.E-08	---	1.E-09	2.E-08						
			1,2,3,6,7,8-HxCDF	1.E-08	---	6.E-10	1.E-08						
			1,2,3,7,8,9-HxCDF	5.E-09	---	3.E-10	6.E-09						
			2,3,4,6,7,8-HxCDF	1.E-08	---	7.E-10	1.E-08						
			1,2,3,4,6,7,8-HpCDF	4.E-09	---	2.E-10	4.E-09						
			1,2,3,4,7,8,9-HpCDF	5.E-10	---	2.E-11	5.E-10						
			OCDF	7.E-11	---	3.E-12	7.E-11						
			Arsenic	8.E-07	---	5.E-08	9.E-07						
			(Total)	3.E-05	---	6.E-06	3.E-05						

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation (1)	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation (1)	Dermal	Exposure Routes Total
Groundwater	Groundwater	Tapwater	Benzene	5.E-07	---	1.E-07	7.E-07	Benzene	hematologic	6.E-01	---	2.E-01	8.E-01
			Chloromethane	3.E-08	---	3.E-10	3.E-08	Chloroethane	reproductive	9.E-04	---	2.E-05	9.E-04
			1,2-Dichloroethane	3.E-07	---	4.E-09	3.E-07	Chloromethane	central nervous	2.E-02	---	2.E-04	2.E-02
			1,1-Dichloroethene	2.E-06	---	7.E-08	2.E-06	1,1-Dichloroethane	no observed effect	2.E-02	---	4.E-04	2.E-02
			Methylene Chloride	3.E-07	---	4.E-09	3.E-07	1,1-Dichloroethene	liver	1.E-02	---	4.E-04	1.E-02
			1,1,2,2-Tetrachloroethane	5.E-07	---	1.E-08	5.E-07	1,2-Dichloroethene (cis)	liver	7.E-01	---	2.E-02	7.E-01
			Tetrachloroethene	3.E-07	---	3.E-07	6.E-07	1,2-Dichloroethene (trans)	liver	1.E-02	---	3.E-04	1.E-02
			Trichloroethene	4.E-07	---	2.E-07	6.E-07	Ethylbenzene	liver, kidney	1.E-02	---	4.E-02	5.E-02
			Vinyl Chloride	7.E-05	---	1.E-06	7.E-05	Methylene Chloride	liver	2.E-02	---	3.E-04	2.E-02
			Aldrin	4.E-07	---	2.E-09	4.E-07	Tetrachloroethene	liver	2.E-02	---	2.E-02	4.E-02
			alpha-BHC	7.E-08	---	4.E-08	1.E-07	Toluene	liver, kidney	9.E-03	---	2.E-02	3.E-02
			gamma-BHC (Lindane)	3.E-08	---	2.E-08	5.E-08	1,1,1-Trichloroethane	central nervous	1.E-01	---	4.E-03	1.E-01
			Dieldrin	3.E-07	---	1.E-08	3.E-07	Vinyl Chloride	liver	2.E-01	---	4.E-03	2.E-01
			Heptachlor	7.E-08	---	2.E-09	7.E-08	C9-C10 Aromatics	decreased body weight	3.E-01	---	6.E-02	4.E-01
			Heptachlor Epoxide	9.E-08	---	3.E-09	9.E-08	C11-C22 Aromatics	decreased body weight	1.E-01	---	4.E-01	5.E-01
			Arsenic	3.E-05	---	7.E-08	3.E-05	2-Methylnaphthalene	decreased body weight	3.E-02	---	5.E-03	3.E-02
			(Total)	1.E-04	---	2.E-06	1.E-04	Naphthalene	decreased body weight	5.E-02	---	9.E-03	6.E-02
								1,2-Dichlorobenzene	no observed effect	1.E-03	---	2.E-04	2.E-03
								Aldrin	liver	3.E-02	---	1.E-04	3.E-02
								gamma-BHC (Lindane)	liver, kidney	3.E-03	---	2.E-03	5.E-03
								Dieldrin	liver	1.E-02	---	6.E-04	1.E-02
								Heptachlor	liver	1.E-03	---	3.E-05	1.E-03
								Heptachlor Epoxide	liver	3.E-02	---	7.E-04	3.E-02
								Antimony	longevity, blood glucose, cholesterol	4.E-01	---	1.E-02	4.E-01
								Arsenic	skin, circulatory	2.E+00	---	6.E-03	2.E+00
								Barium	kidney	8.E-02	---	4.E-03	8.E-02
								Cadmium (Water)	kidney	7.E-02	---	4.E-03	7.E-02
								Chromium VI (aerosols)	no observed effect	2.E-01	---	1.E-01	3.E-01
								Manganese	central nervous	5.E+00	---	3.E-01	5.E+00
								Nitrate	circulatory	9.E-03	---	2.E-05	9.E-03
								Selenium	clinical selenosis	6.E-02	---	2.E-04	6.E-02
								(Total)		1.E+01	---	1.E+00	1.E+01

Total Risk Across Soil	3E-05
Total Risk Across Groundwater	1E-04
(2) Total Risk Across All Media and Direct Exposure Routes	1E-04
(3) Total Risk Across All Media and All Exposure Routes	2.E-04

(4) Total Hazard Index Across All Media and Direct Exposure Routes	3.E+01
(5) Total Hazard Index Across All Media and All Exposure Routes	3.E+01

(6) Total Hazard Index Divided by Target Organ

$HI_{hematologic}$	3.E+00	HI_{immune}	2.E+01
$HI_{reproductive}$	2.E+00	$HI_{gastrointestinal}$	2.E+00
$HI_{central\ nervous}$	7.E+00	HI_{skin}	4.E+00
HI_{kidney}	2.E+00	HI_{liver}	3.E+00
$HI_{circulatory}$	4.E+00		

(1) Risk from soil dust and vapor inhalation is based on modeled EPCs (see equations and text in section 3.3.6) and calculations of dose as shown in sections 3.4.6 and 3.4.7 of the Baseline Risk Assessment report.

Following USEPA Guidance, we assume that the hazard and risk from indoor inhalation of VOCs in groundwater are equal to the hazard and risk estimated for ingestion of VOCs in groundwater (USEPA Region 1 Risk Update, 1995).

(2) The "Total Risk Across All Media and Direct Exposure Routes" is the risk from the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.

(3) The "Total Risk Across All Media and All Exposure Routes" is the risk from the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.

(4) The "Total Hazard Index Across All Media and Direct Exposure Routes" is the HI for the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.

(5) The "Total Hazard Index Across All Media and All Exposure Routes" is the HI for the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.

(6) The "Total Hazard Index Across All Media and Direct Exposure Routes" is divided based on the primary target organ for each COC (see Table 16 of the Baseline Risk Assessment report).

Each COC may affect more than one target organ, thus the sum of the hazard indices by target organ does not equal the total hazard index.

TABLE 9.3.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

REASONABLE MAXIMUM EXPOSURE

Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation (1)	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation (1)	Dermal	Exposure Routes Total
Soil	Surface soil	0 to 1 foot soil	Tetrachloroethene	3.E-08	---	---	3.E-08	1,2-Dichloroethene (cis)	liver	3.E-07	---	---	3.E-07
			Benz(a)anthracene	6.E-07	---	3.E-07	9.E-07	Tetrachloroethene	liver	1.E-04	---	---	1.E-04
			Benzo(a)pyrene	3.E-06	---	2.E-06	5.E-06	C9-C18 Aliphatics	liver , hematologic	3E-02	---	2E-02	5.E-02
			Benzo(b)fluoranthene	2.E-07	---	1.E-07	3.E-07	C11-C22 Aromatics	decreased body weight	2E-01	---	1E-01	3.E-01
			Benzo(k)fluoranthene	3.E-08	---	1.E-08	4.E-08	Naphthalene	decreased body weight	2E-05	---	7E-05	9.E-05
			Chrysene	3.E-09	---	2.E-09	5.E-09	bis(2-Ethylhexyl)phthalate	liver	4.E-03	---	2.E-03	6.E-03
			Dibenz(ah)anthracene	4.E-07	---	2.E-07	7.E-07	Polychlorinated Biphenyls	immune	1.E+01	---	7.E+00	2.E+01
			Indeno(123-cd)pyrene	1.E-07	---	5.E-08	2.E-07	Antimony	longevity, blood glucose, cholesterol	1.E-03	---	4.E-04	1.E-03
			bis(2-Ethylhexyl)phthalate	4.E-07	---	2.E-07	6.E-07	Arsenic	skin, circulatory	1.E-02	---	2.E-03	2.E-02
			Polychlorinated Biphenyls	2.E-04	---	9.E-05	2.E-04	Barium	kidney	3.E-02	---	2.E-02	5.E-02
			PCB-77	1.E-05	---	5.E-06	2.E-05	Beryllium	gastrointestinal	1.E-04	---	4.E-04	6.E-04
			PCB-81	3.E-07	---	2.E-07	5.E-07	Cadmium (Food)	kidney	1.E-02	---	2.E-02	4.E-02
			PCB-105	1.E-05	---	8.E-06	2.E-05	Chromium VI (particulates)	no observed effect	1.E-01	---	4.E-01	6.E-01
			PCB-114	7.E-06	---	4.E-06	1.E-05	Copper	gastrointestinal	3.E-04	---	3.E-05	4.E-04
			PCB-118	2.E-05	---	1.E-05	4.E-05	Manganese	central nervous	2.E-03	---	2.E-03	4.E-03
			PCB-123	2.E-06	---	1.E-06	4.E-06	Mercury	central nervous	2.E-03	---	1.E-03	3.E-03
			PCB-126	9.E-05	---	5.E-05	1.E-04	Molybdenum	kidney	5.E-04	---	2.E-05	5.E-04
			PCB-156	4.E-06	---	2.E-06	6.E-06	Nickel	decreased body and organ weights	3.E-02	---	1.E-01	1.E-01
			PCB-157	9.E-07	---	5.E-07	1.E-06	Vanadium	decreased hair cystine	1.E-03	---	3.E-03	4.E-03
			PCB-167	1.E-07	---	8.E-08	2.E-07	Zinc	decrease in ESOD	3.E-03	---	5.E-04	4.E-03
			PCB-189	3.E-08	---	1.E-08	4.E-08	(Total)		1.E+01	---	7.E+00	2.E+01
			2,3,7,8-TCDD	1.E-08	---	2.E-09	1.E-08						
			1,2,3,7,8-PeCDD	1.E-07	---	1.E-08	1.E-07						
			1,2,3,4,7,8-HxCDD	2.E-08	---	2.E-09	2.E-08						
			1,2,3,6,7,8-HxCDD	4.E-08	---	5.E-09	4.E-08						
			1,2,3,7,8,9-HxCDD	3.E-08	---	4.E-09	4.E-08						
			1,2,3,4,6,7,8-HpCDD	8.E-08	---	1.E-08	9.E-08						
			OCDD	6.E-09	---	8.E-10	7.E-09						
			2,3,7,8-TCDF	2.E-07	---	2.E-08	2.E-07						
			1,2,3,7,8-PeCDF	4.E-08	---	4.E-09	4.E-08						
			2,3,4,7,8-PeCDF	2.E-06	---	3.E-07	3.E-06						
			1,2,3,4,7,8-HxCDF	1.E-07	---	1.E-08	1.E-07						
			1,2,3,6,7,8-HxCDF	6.E-08	---	7.E-09	7.E-08						
			1,2,3,7,8,9-HxCDF	4.E-08	---	4.E-09	4.E-08						
			2,3,4,6,7,8-HxCDF	7.E-08	---	8.E-09	8.E-08						
			1,2,3,4,6,7,8-HpCDF	2.E-08	---	2.E-09	2.E-08						
			1,2,3,4,7,8,9-HpCDF	3.E-09	---	3.E-10	3.E-09						
			OCDF	3.E-10	---	4.E-11	4.E-10						
			Arsenic	2.E-06	---	3.E-07	3.E-06						
			(Total)	3.E-04	---	2.E-04	5.E-04						

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk			
				Ingestion	Inhalation (1)	Dermal	Exposure Routes Total
Groundwater	Groundwater	Tapwater	Benzene	7.E-05	---	7.E-05	1.E-04
			Chloromethane	6.E-07	---	2.E-08	6.E-07
			1,2-Dichloroethane	2.E-05	---	7.E-07	2.E-05
			1,1-Dichloroethene	7.E-05	---	1.E-05	8.E-05
			Methylene Chloride	1.E-04	---	5.E-06	1.E-04
			1,1,2,2-Tetrachloroethane	4.E-06	---	3.E-07	4.E-06
			Tetrachloroethene	1.E-05	---	4.E-05	5.E-05
			Trichloroethene	9.E-05	---	2.E-04	3.E-04
			Vinyl Chloride	2.E-02	---	1.E-03	2.E-02
			Aldrin	8.E-06	---	1.E-07	8.E-06
			alpha-BHC	2.E-06	---	3.E-06	4.E-06
			gamma-BHC (Lindane)	9.E-07	---	2.E-06	3.E-06
			Dieldrin	7.E-06	---	1.E-06	8.E-06
			Heptachlor	2.E-06	---	2.E-07	2.E-06
			Heptachlor Epoxide	2.E-06	---	2.E-07	2.E-06
			Arsenic	4.E-04	---	4.E-06	4.E-04
			(Total)	2.E-02	---	1.E-03	2.E-02

Chemical	Non-Carcinogenic Hazard Quotient				
	Primary Target Organ	Ingestion	Inhalation (1)	Dermal	Exposure Routes Total
Benzene	hematologic	7.E+00	---	7.E+00	1.E+01
Chloroethane	reproductive	2.E-02	---	1.E-03	2.E-02
Chloromethane	central nervous	3.E-02	---	1.E-03	4.E-02
1,1-Dichloroethane	no observed effect	3.E-01	---	2.E-02	3.E-01
1,1-Dichloroethene	liver	4.E-02	---	5.E-03	4.E-02
1,2-Dichloroethene (cis)	liver	7.E+00	---	6.E-01	7.E+00
1,2-Dichloroethene (trans)	liver	1.E-01	---	1.E-02	1.E-01
Ethylbenzene	liver, kidney	3.E-01	---	2.E+00	3.E+00
Methylene Chloride	liver	9.E-01	---	4.E-02	9.E-01
Tetrachloroethene	liver	7.E-02	---	2.E-01	3.E-01
Toluene	liver, kidney	8.E-02	---	7.E-01	8.E-01
1,1,1-Trichloroethane	central nervous	9.E-01	---	1.E-01	1.E+00
Vinyl Chloride	liver	4.E+00	---	3.E-01	4.E+00
C9-C10 Aromatics	decreased body weight	5.E-01	---	3.E-01	9.E-01
C11-C22 Aromatics	decreased body weight	2.E-01	---	2.E+00	2.E+00
2-Methylnaphthalene	decreased body weight	5.E-02	---	3.E-02	8.E-02
Naphthalene	decreased body weight	3.E-01	---	2.E-01	5.E-01
1,2-Dichlorobenzene	no observed effect	7.E-03	---	4.E-03	1.E-02
Aldrin	liver	4.E-02	---	6.E-04	4.E-02
gamma-BHC (Lindane)	liver, kidney	7.E-03	---	1.E-02	2.E-02
Dieldrin	liver	3.E-02	---	4.E-03	3.E-02
Heptachlor	liver	2.E-03	---	2.E-04	2.E-03
Heptachlor Epoxide	liver	4.E-02	---	4.E-03	5.E-02
Antimony	longevity, blood glucose, cholesterol	5.E-01	---	4.E-02	5.E-01
Arsenic	skin, circulatory	3.E+00	---	2.E-02	3.E+00
Barium	kidney	2.E-01	---	3.E-02	2.E-01
Cadmium (Water)	kidney	4.E-01	---	8.E-02	5.E-01
Chromium VI (aerosols)	no observed effect	6.E-01	---	1.E+00	2.E+00
Manganese	central nervous	7.E+00	---	1.E+00	9.E+00
Nitrate	circulatory	1.E-01	---	9.E-04	1.E-01
Selenium	clinical selenosis	1.E-01	---	1.E-03	1.E-01
(Total)		3.E+01	---	2.E+01	5.E+01

Total Risk Across Soil	5E-04
Total Risk Across Groundwater	2E-02
(2) Total Risk Across All Media and Direct Exposure Routes	2.E-02
(3) Total Risk Across All Media and All Exposure Routes	4.E-02

(4) Total Hazard Index Across All Media and Direct Exposure Routes	7.E+01
(5) Total Hazard Index Across All Media and All Exposure Routes	9.E+01

(6) Total Hazard Index Divided by Target Organ

$HI_{hematologic}$	2.E+01	HI_{immune}	3.E+01
$HI_{reproductive}$	7.E+00	$HI_{gastrointestinal}$	7.E+00
$HI_{central\ nervous}$	2.E+01	HI_{skin}	1.E+01
HI_{kidney}	1.E+01	HI_{liver}	2.E+01
$HI_{circulatory}$	1.E+01		

(1) Risk from soil dust and vapor inhalation is based on modeled EPCs (see equations and text in section 3.3.6) and calculations of dose as shown in sections 3.4.6 and 3.4.7 of the Baseline Risk Assessment report.

Following USEPA Guidance, we assume that the hazard and risk from indoor inhalation of VOCs in groundwater are equal to the hazard and risk estimated for ingestion of VOCs in groundwater (USEPA Region 1 Risk Update, 1995).

(2) The "Total Risk Across All Media and Direct Exposure Routes" is the risk from the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.

(3) The "Total Risk Across All Media and All Exposure Routes" is the risk from the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.

(4) The "Total Hazard Index Across All Media and Direct Exposure Routes" is the HI for the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.

(5) The "Total Hazard Index Across All Media and All Exposure Routes" is the HI for the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.

(6) The "Total Hazard Index Across All Media and Direct Exposure Routes" is divided based on the primary target organ for each COC (see Table 16 of the Baseline Risk Assessment report).

Each COC may affect more than one target organ, thus the sum of the hazard indices by target organ does not equal the total hazard index.

TABLE 9.3.CT

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

CENTRAL TENDENCY

Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation (1)	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation (1)	Dermal	Exposure Routes Total
Soil	Surface soil	0 to 1 foot soil	Tetrachloroethene	3.E-10	---	---	3.E-10	1,2-Dichloroethene (cis)	liver	1.E-07	---	---	1.E-07
			Benz(a)anthracene	8.E-08	---	1.E-08	1.E-07	Tetrachloroethene	liver	5.E-06	---	---	5.E-06
			Benzo(a)pyrene	1.E-07	---	2.E-08	1.E-07	C9-C18 Aliphatics	liver , hematologic	2E-03	---	3E-04	2.E-03
			Benzo(b)fluoranthene	3.E-08	---	4.E-09	3.E-08	C11-C22 Aromatics	decreased body weight	9E-03	---	2E-03	1.E-02
			Benzo(k)fluoranthene	1.E-09	---	1.E-10	1.E-09	Naphthalene	decreased body weight	1E-06	---	1E-06	2.E-06
			Chrysene	5.E-10	---	7.E-11	6.E-10	bis(2-Ethylhexyl)phthalate	liver	4.E-04	---	5.E-05	4.E-04
			Dibenz(ah)anthracene	6.E-08	---	9.E-09	7.E-08	Polychlorinated Biphenyls	immune	6.E+00	---	9.E-01	7.E+00
			Indeno(123-cd)pyrene	2.E-08	---	2.E-09	2.E-08	Antimony	longevity, blood glucose, cholesterol	5.E-04	---	6.E-05	5.E-04
			bis(2-Ethylhexyl)phthalate	1.E-08	---	1.E-09	1.E-08	Arsenic	skin, circulatory	7.E-03	---	3.E-04	8.E-03
			Polychlorinated Biphenyls	1.E-05	---	2.E-06	1.E-05	Barium	kidney	6.E-04	---	1.E-04	8.E-04
			PCB-77	3.E-07	---	5.E-08	4.E-07	Beryllium	gastrointestinal	6.E-05	---	6.E-05	1.E-04
			PCB-81	2.E-08	---	2.E-09	2.E-08	Cadmium (Food)	kidney	3.E-04	---	2.E-04	5.E-04
			PCB-105	5.E-07	---	7.E-08	5.E-07	Chromium VI (particulates)	no observed effect	3.E-03	---	4.E-03	7.E-03
			PCB-114	2.E-07	---	4.E-08	3.E-07	Copper	gastrointestinal	2.E-04	---	4.E-06	2.E-04
			PCB-118	8.E-07	---	1.E-07	9.E-07	Manganese	central nervous	5.E-04	---	1.E-04	6.E-04
			PCB-123	8.E-08	---	1.E-08	1.E-07	Mercury	central nervous	9.E-04	---	2.E-04	1.E-03
			PCB-126	4.E-06	---	6.E-07	4.E-06	Molybdenum	kidney	2.E-04	---	3.E-06	2.E-04
			PCB-156	1.E-07	---	2.E-08	2.E-07	Nickel	decreased body and organ weights	6.E-04	---	7.E-04	1.E-03
			PCB-157	3.E-08	---	5.E-09	4.E-08	Vanadium	decreased hair cystine	7.E-04	---	4.E-04	1.E-03
			PCB-167	5.E-09	---	8.E-10	6.E-09	Zinc	decrease in ESOD	1.E-04	---	5.E-06	1.E-04
			PCB-189	4.E-09	---	6.E-10	5.E-09	(Total)		6.E+00	---	1.E+00	7.E+00
			2,3,7,8-TCDD	1.E-09	---	5.E-11	1.E-09						
			1,2,3,7,8-PeCDD	8.E-09	---	3.E-10	9.E-09						
			1,2,3,4,7,8-HxCDD	1.E-09	---	5.E-11	1.E-09						
			1,2,3,6,7,8-HxCDD	4.E-09	---	1.E-10	4.E-09						
			1,2,3,7,8,9-HxCDD	3.E-09	---	9.E-11	3.E-09						
			1,2,3,4,6,7,8-HpCDD	6.E-09	---	2.E-10	6.E-09						
			OCDD	5.E-10	---	2.E-11	5.E-10						
			2,3,7,8-TCDF	9.E-09	---	3.E-10	1.E-08						
			1,2,3,7,8-PeCDF	2.E-09	---	6.E-11	2.E-09						
			2,3,4,7,8-PeCDF	1.E-07	---	4.E-09	1.E-07						
			1,2,3,4,7,8-HxCDF	7.E-09	---	2.E-10	7.E-09						
			1,2,3,6,7,8-HxCDF	4.E-09	---	1.E-10	4.E-09						
			1,2,3,7,8,9-HxCDF	2.E-09	---	7.E-11	2.E-09						
			2,3,4,6,7,8-HxCDF	5.E-09	---	2.E-10	5.E-09						
			1,2,3,4,6,7,8-HpCDF	2.E-09	---	5.E-11	2.E-09						
			1,2,3,4,7,8,9-HpCDF	2.E-10	---	6.E-12	2.E-10						
			OCDF	2.E-11	---	8.E-13	3.E-11						
			Arsenic	3.E-07	---	1.E-08	3.E-07						
			(Total)	2.E-05	---	3.E-06	2.E-05						

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation (1)	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation (1)	Dermal	Exposure Routes Total
Groundwater	Groundwater	Tapwater	Benzene	6.E-07	---	3.E-07	9.E-07	Benzene	hematologic	2.E-01	---	1.E-01	3.E-01
			Chloromethane	4.E-08	---	7.E-10	4.E-08	Chloroethane	reproductive	3.E-04	---	1.E-05	3.E-04
			1,2-Dichloroethane	3.E-07	---	8.E-09	4.E-07	Chloromethane	central nervous	7.E-03	---	1.E-04	7.E-03
			1,1-Dichloroethene	2.E-06	---	1.E-07	2.E-06	1,1-Dichloroethane	no observed effect	5.E-03	---	2.E-04	6.E-03
			Methylene Chloride	4.E-07	---	7.E-09	4.E-07	1,1-Dichloroethene	liver	4.E-03	---	2.E-04	4.E-03
			1,1,2,2-Tetrachloroethane	6.E-07	---	2.E-08	6.E-07	1,2-Dichloroethene (cis)	liver	2.E-01	---	1.E-02	3.E-01
			Tetrachloroethene	3.E-07	---	5.E-07	9.E-07	1,2-Dichloroethene (trans)	liver	4.E-03	---	2.E-04	4.E-03
			Trichloroethene	5.E-07	---	5.E-07	9.E-07	Ethylbenzene	liver, kidney	5.E-03	---	2.E-02	3.E-02
			Vinyl Chloride	8.E-05	---	3.E-06	8.E-05	Methylene Chloride	liver	8.E-03	---	2.E-04	8.E-03
			Aldrin	5.E-07	---	3.E-09	5.E-07	Tetrachloroethene	liver	7.E-03	---	1.E-02	2.E-02
			alpha-BHC	9.E-08	---	8.E-08	2.E-07	Toluene	liver, kidney	3.E-03	---	1.E-02	2.E-02
			gamma-BHC (Lindane)	4.E-08	---	4.E-08	8.E-08	1,1,1-Trichloroethane	central nervous	3.E-02	---	2.E-03	4.E-02
			Dieldrin	4.E-07	---	3.E-08	4.E-07	Vinyl Chloride	liver	7.E-02	---	2.E-03	7.E-02
			Heptachlor	8.E-08	---	4.E-09	8.E-08	C9-C10 Aromatics	decreased body weight	1.E-01	---	3.E-02	1.E-01
			Heptachlor Epoxide	1.E-07	---	5.E-09	1.E-07	C11-C22 Aromatics	decreased body weight	4.E-02	---	2.E-01	3.E-01
			Arsenic	3.E-05	---	1.E-07	3.E-05	2-Methylnaphthalene	decreased body weight	1.E-02	---	3.E-03	1.E-02
			(Total)	1.E-04	---	4.E-06	1.E-04	Naphthalene	decreased body weight	2.E-02	---	5.E-03	2.E-02
								1,2-Dichlorobenzene	no observed effect	5.E-04	---	1.E-04	6.E-04
								Aldrin	liver	1.E-02	---	7.E-05	1.E-02
								gamma-BHC (Lindane)	liver, kidney	1.E-03	---	9.E-04	2.E-03
								Dieldrin	liver	5.E-03	---	3.E-04	5.E-03
								Heptachlor	liver	4.E-04	---	2.E-05	4.E-04
								Heptachlor Epoxide	liver	9.E-03	---	4.E-04	9.E-03
								Antimony	longevity, blood glucose, cholesterol	1.E-01	---	6.E-03	2.E-01
								Arsenic	skin, circulatory	7.E-01	---	3.E-03	7.E-01
								Barium	kidney	3.E-02	---	2.E-03	3.E-02
								Cadmium (Water)	kidney	2.E-02	---	2.E-03	3.E-02
								Chromium VI (aerosols)	no observed effect	8.E-02	---	7.E-02	1.E-01
								Manganese	central nervous	2.E+00	---	1.E-01	2.E+00
								Nitrate	circulatory	3.E-03	---	1.E-05	3.E-03
								Selenium	clinical selenosis	2.E-02	---	1.E-04	2.E-02
								(Total)		3.E+00	---	6.E-01	4.E+00

Total Risk Across Soil	2E-05
Total Risk Across Groundwater	1E-04
(2) Total Risk Across All Media and Direct Exposure Routes	1E-04
(3) Total Risk Across All Media and All Exposure Routes	2.E-04

(4) Total Hazard Index Across All Media and Direct Exposure Routes	1.E+01
(5) Total Hazard Index Across All Media and All Exposure Routes	1.E+01

(6) Total Hazard Index Divided by Target Organ

$HI_{hematologic}$	1.E+00	HI_{immune}	8.E+00
$HI_{reproductive}$	8.E-01	$HI_{gastrointestinal}$	8.E-01
$HI_{central\ nervous}$	3.E+00	HI_{skin}	1.E+00
HI_{kidney}	9.E-01	HI_{liver}	1.E+00
$HI_{circulatory}$	2.E+00		

(1) Risk from soil dust and vapor inhalation is based on modeled EPCs (see equations and text in section 3.3.6) and calculations of dose as shown in sections 3.4.6 and 3.4.7 of the Baseline Risk Assessment report.

Following USEPA Guidance, we assume that the hazard and risk from indoor inhalation of VOCs in groundwater are equal to the hazard and risk estimated for ingestion of VOCs in groundwater (USEPA Region 1 Risk Update, 1995).

(2) The "Total Risk Across All Media and Direct Exposure Routes" is the risk from the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.

(3) The "Total Risk Across All Media and All Exposure Routes" is the risk from the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.

(4) The "Total Hazard Index Across All Media and Direct Exposure Routes" is the HI for the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.

(5) The "Total Hazard Index Across All Media and All Exposure Routes" is the HI for the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.

(6) The "Total Hazard Index Across All Media and Direct Exposure Routes" is divided based on the primary target organ for each COC (see Table 16 of the Baseline Risk Assessment report).

Each COC may affect more than one target organ, thus the sum of the hazard indices by target organ does not equal the total hazard index.

TABLE 9.4.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

REASONABLE MAXIMUM EXPOSURE

Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation (1)	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation (1)	Dermal	Exposure Routes Total
Soil	Surface soil	0 to 1 foot soil	Tetrachloroethene	6.E-08	---	---	6.E-08	1,2-Dichloroethene (cis)	liver	2.E-06	---	---	2.E-06
			Benz(a)anthracene	1.E-06	---	5.E-07	2.E-06	Tetrachloroethene	liver	1.E-03	---	---	1.E-03
			Benzo(a)pyrene	7.E-06	---	3.E-06	1.E-05	C9-C18 Aliphatics	liver , hematologic	3E-01	---	2E-01	4.E-01
			Benzo(b)fluoranthene	4.E-07	---	2.E-07	6.E-07	C11-C22 Aromatics	decreased body weight	2E+00	---	8E-01	2.E+00
			Benzo(k)fluoranthene	6.E-08	---	2.E-08	9.E-08	Naphthalene	decreased body weight	2E-04	---	5E-04	7.E-04
			Chrysene	8.E-09	---	3.E-09	1.E-08	bis(2-Ethylhexyl)phthalate	liver	4.E-02	---	1.E-02	5.E-02
			Dibenz(ah)anthracene	1.E-06	---	4.E-07	1.E-06	Polychlorinated Biphenyls	immune	1.E+02	---	5.E+01	2.E+02
			Indeno(123-cd)pyrene	2.E-07	---	9.E-08	3.E-07	Antimony	longevity, blood glucose, cholesterol	9.E-03	---	3.E-03	1.E-02
			bis(2-Ethylhexyl)phthalate	9.E-07	---	3.E-07	1.E-06	Arsenic	skin, circulatory	1.E-01	---	1.E-02	1.E-01
			Polychlorinated Biphenyls	4.E-04	---	2.E-04	5.E-04	Barium	kidney	3.E-01	---	2.E-01	4.E-01
			PCB-77	2.E-05	---	9.E-06	3.E-05	Beryllium	gastrointestinal	1.E-03	---	3.E-03	4.E-03
			PCB-81	7.E-07	---	3.E-07	1.E-06	Cadmium (Food)	kidney	1.E-01	---	2.E-01	3.E-01
			PCB-105	3.E-05	---	1.E-05	5.E-05	Chromium VI (particulates)	no observed effect	1.E+00	---	3.E+00	4.E+00
			PCB-114	2.E-05	---	7.E-06	2.E-05	Copper	gastrointestinal	3.E-03	---	2.E-04	3.E-03
			PCB-118	5.E-05	---	2.E-05	8.E-05	Manganese	central nervous	2.E-02	---	1.E-02	3.E-02
			PCB-123	6.E-06	---	2.E-06	8.E-06	Mercury	central nervous	2.E-02	---	7.E-03	2.E-02
			PCB-126	2.E-04	---	9.E-05	3.E-04	Molybdenum	kidney	4.E-03	---	1.E-04	4.E-03
			PCB-156	8.E-06	---	3.E-06	1.E-05	Nickel	decreased body and organ weights	3.E-01	---	8.E-01	1.E+00
			PCB-157	2.E-06	---	8.E-07	3.E-06	Vanadium	decreased hair cystine	1.E-02	---	2.E-02	3.E-02
			PCB-167	3.E-07	---	1.E-07	4.E-07	Zinc	decrease in ESOD	3.E-02	---	4.E-03	3.E-02
			PCB-189	6.E-08	---	3.E-08	9.E-08	(Total)		1.E+02	---	5.E+01	2.E+02
			2,3,7,8-TCDD	3.E-08	---	3.E-09	3.E-08						
			1,2,3,7,8-PeCDD	3.E-07	---	2.E-08	3.E-07						
			1,2,3,4,7,8-HxCDD	4.E-08	---	3.E-09	4.E-08						
			1,2,3,6,7,8-HxCDD	9.E-08	---	8.E-09	1.E-07						
			1,2,3,7,8,9-HxCDD	8.E-08	---	7.E-09	8.E-08						
			1,2,3,4,6,7,8-HpCDD	2.E-07	---	2.E-08	2.E-07						
			OCDD	2.E-08	---	1.E-09	2.E-08						
			2,3,7,8-TCDF	4.E-07	---	4.E-08	5.E-07						
			1,2,3,7,8-PeCDF	8.E-08	---	7.E-09	9.E-08						
			2,3,4,7,8-PeCDF	5.E-06	---	5.E-07	6.E-06						
			1,2,3,4,7,8-HxCDF	2.E-07	---	2.E-08	3.E-07						
			1,2,3,6,7,8-HxCDF	1.E-07	---	1.E-08	2.E-07						
			1,2,3,7,8,9-HxCDF	8.E-08	---	7.E-09	9.E-08						
			2,3,4,6,7,8-HxCDF	2.E-07	---	1.E-08	2.E-07						
			1,2,3,4,6,7,8-HpCDF	5.E-08	---	4.E-09	5.E-08						
			1,2,3,4,7,8,9-HpCDF	6.E-09	---	5.E-10	6.E-09						
			OCDF	8.E-10	---	7.E-11	8.E-10						
			Arsenic	5.E-06	---	5.E-07	6.E-06						
			(Total)	7.E-04	---	3.E-04	1.E-03						

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk			
				Ingestion	Inhalation (1)	Dermal	Exposure Routes Total
Groundwater	Groundwater	Tapwater	Benzene	6.E-05	---	3.E-05	9.E-05
			Chloromethane	5.E-07	---	1.E-08	5.E-07
			1,2-Dichloroethane	1.E-05	---	3.E-07	1.E-05
			1,1-Dichloroethene	6.E-05	---	4.E-06	6.E-05
			Methylene Chloride	1.E-04	---	2.E-06	1.E-04
			1,1,2,2-Tetrachloroethane	3.E-06	---	1.E-07	3.E-06
			Tetrachloroethene	1.E-05	---	2.E-05	3.E-05
			Trichloroethene	8.E-05	---	8.E-05	2.E-04
			Vinyl Chloride	2.E-02	---	5.E-04	2.E-02
			Aldrin	7.E-06	---	5.E-08	7.E-06
			alpha-BHC	1.E-06	---	1.E-06	3.E-06
			gamma-BHC (Lindane)	8.E-07	---	8.E-07	2.E-06
			Dieldrin	6.E-06	---	5.E-07	7.E-06
			Heptachlor	2.E-06	---	8.E-08	2.E-06
			Heptachlor Epoxide	1.E-06	---	8.E-08	2.E-06
			Arsenic	3.E-04	---	2.E-06	3.E-04
			(Total)	2.E-02	---	6.E-04	2.E-02

Chemical	Non-Carcinogenic Hazard Quotient				
	Primary Target Organ	Ingestion	Inhalation (1)	Dermal	Exposure Routes Total
Benzene	hematologic	2.E+01	---	1.E+01	3.E+01
Chloroethane	reproductive	6.E-02	---	2.E-03	6.E-02
Chloromethane	central nervous	1.E-01	---	2.E-03	1.E-01
1,1-Dichloroethane	no observed effect	1.E+00	---	4.E-02	1.E+00
1,1-Dichloroethene	liver	1.E-01	---	9.E-03	1.E-01
1,2-Dichloroethene (cis)	liver	2.E+01	---	1.E+00	3.E+01
1,2-Dichloroethene (trans)	liver	5.E-01	---	2.E-02	5.E-01
Ethylbenzene	liver, kidney	9.E-01	---	4.E+00	5.E+00
Methylene Chloride	liver	3.E+00	---	6.E-02	3.E+00
Tetrachloroethene	liver	2.E-01	---	4.E-01	6.E-01
Toluene	liver, kidney	3.E-01	---	1.E+00	1.E+00
1,1,1-Trichloroethane	central nervous	3.E+00	---	2.E-01	3.E+00
Vinyl Chloride	liver	1.E+01	---	5.E-01	1.E+01
C9-C10 Aromatics	decreased body weight	2.E+00	---	6.E-01	2.E+00
C11-C22 Aromatics	decreased body weight	7.E-01	---	4.E+00	5.E+00
2-Methylnaphthalene	decreased body weight	2.E-01	---	6.E-02	2.E-01
Naphthalene	decreased body weight	1.E+00	---	3.E-01	1.E+00
1,2-Dichlorobenzene	no observed effect	2.E-02	---	7.E-03	3.E-02
Aldrin	liver	2.E-01	---	1.E-03	2.E-01
gamma-BHC (Lindane)	liver, kidney	2.E-02	---	2.E-02	5.E-02
Dieldrin	liver	9.E-02	---	7.E-03	1.E-01
Heptachlor	liver	8.E-03	---	4.E-04	8.E-03
Heptachlor Epoxide	liver	1.E-01	---	7.E-03	2.E-01
Antimony	longevity, blood glucose, cholesterol	2.E+00	---	8.E-02	2.E+00
Arsenic	skin, circulatory	9.E+00	---	4.E-02	9.E+00
Barium	kidney	6.E-01	---	6.E-02	7.E-01
Cadmium (Water)	kidney	2.E+00	---	1.E-01	2.E+00
Chromium VI (aerosols)	no observed effect	2.E+00	---	2.E+00	4.E+00
Manganese	central nervous	3.E+01	---	2.E+00	3.E+01
Nitrate	circulatory	4.E-01	---	2.E-03	4.E-01
Selenium	clinical selenosis	4.E-01	---	2.E-03	4.E-01
(Total)		1.E+02	---	3.E+01	1.E+02

Total Risk Across Soil	1E-03
Total Risk Across Groundwater	2E-02
(2) Total Risk Across All Media and Direct Exposure Routes	2E-02
(3) Total Risk Across All Media and All Exposure Routes	3.E-02

(4) Total Hazard Index Across All Media and Direct Exposure Routes	3.E+02
(5) Total Hazard Index Across All Media and All Exposure Routes	4.E+02

(6) Total Hazard Index Divided by Target Organ

$HI_{hematologic}$	6.E+01	HI_{immune}	2.E+02
$HI_{reproductive}$	2.E+01	$HI_{gastrointestinal}$	2.E+01
$HI_{central\ nervous}$	5.E+01	HI_{skin}	3.E+01
HI_{kidney}	4.E+01	HI_{liver}	7.E+01
$HI_{circulatory}$	3.E+01		

(1) Risk from soil dust and vapor inhalation is based on modeled EPCs (see equations and text in section 3.3.6) and calculations of dose as shown in sections 3.4.6 and 3.4.7 of the Baseline Risk Assessment report.

Following USEPA Guidance, we assume that the hazard and risk from indoor inhalation of VOCs in groundwater are equal to the hazard and risk estimated for ingestion of VOCs in groundwater (USEPA Region 1 Risk Update, 1995).

(2) The "Total Risk Across All Media and Direct Exposure Routes" is the risk from the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.

(3) The "Total Risk Across All Media and All Exposure Routes" is the risk from the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.

(4) The "Total Hazard Index Across All Media and Direct Exposure Routes" is the HI for the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.

(5) The "Total Hazard Index Across All Media and All Exposure Routes" is the HI for the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.

(6) The "Total Hazard Index Across All Media and Direct Exposure Routes" is divided based on the primary target organ for each COC (see Table 16 of the Baseline Risk Assessment report).

Each COC may affect more than one target organ, thus the sum of the hazard indices by target organ does not equal the total hazard index.

TABLE 9.4.CT

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

CENTRAL TENDENCY

Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation (1)	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation (1)	Dermal	Exposure Routes Total
Soil	Surface soil	0 to 1 foot soil	Tetrachloroethene	7.E-10	---	---	7.E-10	1,2-Dichloroethene (cis)	liver	1.E-06	---	---	1.E-06
			Benz(a)anthracene	2.E-07	---	5.E-08	3.E-07	Tetrachloroethene	liver	5.E-05	---	---	5.E-05
			Benzo(a)pyrene	3.E-07	---	6.E-08	4.E-07	C9-C18 Aliphatics	liver , hematologic	1E-02	---	5E-03	2.E-02
			Benzo(b)fluoranthene	7.E-08	---	2.E-08	9.E-08	C11-C22 Aromatics	decreased body weight	9E-02	---	3E-02	1.E-01
			Benzo(k)fluoranthene	3.E-09	---	6.E-10	3.E-09	Naphthalene	decreased body weight	1E-05	---	2E-05	3.E-05
			Chrysene	1.E-09	---	3.E-10	2.E-09	bis(2-Ethylhexyl)phthalate	liver	3.E-03	---	8.E-04	4.E-03
			Dibenz(ah)anthracene	2.E-07	---	4.E-08	2.E-07	Polychlorinated Biphenyls	immune	6.E+01	---	1.E+01	7.E+01
			Indeno(123-cd)pyrene	4.E-08	---	9.E-09	5.E-08	Antimony	longevity, blood glucose, cholesterol	5.E-03	---	8.E-04	5.E-03
			bis(2-Ethylhexyl)phthalate	3.E-08	---	6.E-09	3.E-08	Arsenic	skin, circulatory	7.E-02	---	4.E-03	7.E-02
			Polychlorinated Biphenyls	3.E-05	---	8.E-06	4.E-05	Barium	kidney	6.E-03	---	2.E-03	8.E-03
			PCB-77	9.E-07	---	2.E-07	1.E-06	Beryllium	gastrointestinal	5.E-04	---	9.E-04	1.E-03
			PCB-81	4.E-08	---	1.E-08	5.E-08	Cadmium (Food)	kidney	3.E-03	---	2.E-03	5.E-03
			PCB-105	1.E-06	---	3.E-07	2.E-06	Chromium VI (particulates)	no observed effect	3.E-02	---	5.E-02	8.E-02
			PCB-114	6.E-07	---	2.E-07	8.E-07	Copper	gastrointestinal	2.E-03	---	5.E-05	2.E-03
			PCB-118	2.E-06	---	5.E-07	3.E-06	Manganese	central nervous	5.E-03	---	2.E-03	6.E-03
			PCB-123	2.E-07	---	5.E-08	3.E-07	Mercury	central nervous	9.E-03	---	2.E-03	1.E-02
			PCB-126	1.E-05	---	2.E-06	1.E-05	Molybdenum	kidney	2.E-03	---	4.E-05	2.E-03
			PCB-156	4.E-07	---	9.E-08	5.E-07	Nickel	decreased body and organ weights	6.E-03	---	1.E-02	2.E-02
			PCB-157	8.E-08	---	2.E-08	1.E-07	Vanadium	decreased hair cystine	7.E-03	---	6.E-03	1.E-02
			PCB-167	1.E-08	---	3.E-09	2.E-08	Zinc	decrease in ESOD	1.E-03	---	7.E-05	1.E-03
			PCB-189	1.E-08	---	3.E-09	1.E-08	(Total)		6.E+01	---	1.E+01	7.E+01
			2,3,7,8-TCDD	4.E-09	---	2.E-10	4.E-09						
			1,2,3,7,8-PeCDD	2.E-08	---	1.E-09	2.E-08						
			1,2,3,4,7,8-HxCDD	4.E-09	---	2.E-10	4.E-09						
			1,2,3,6,7,8-HxCDD	1.E-08	---	5.E-10	1.E-08						
			1,2,3,7,8,9-HxCDD	7.E-09	---	4.E-10	8.E-09						
			1,2,3,4,6,7,8-HpCDD	2.E-08	---	8.E-10	2.E-08						
			OCDD	1.E-09	---	7.E-11	1.E-09						
			2,3,7,8-TCDF	3.E-08	---	1.E-09	3.E-08						
			1,2,3,7,8-PeCDF	5.E-09	---	3.E-10	5.E-09						
			2,3,4,7,8-PeCDF	3.E-07	---	2.E-08	4.E-07						
			1,2,3,4,7,8-HxCDF	2.E-08	---	1.E-09	2.E-08						
			1,2,3,6,7,8-HxCDF	1.E-08	---	6.E-10	1.E-08						
			1,2,3,7,8,9-HxCDF	5.E-09	---	3.E-10	6.E-09						
			2,3,4,6,7,8-HxCDF	1.E-08	---	7.E-10	1.E-08						
			1,2,3,4,6,7,8-HpCDF	4.E-09	---	2.E-10	4.E-09						
			1,2,3,4,7,8,9-HpCDF	5.E-10	---	2.E-11	5.E-10						
			OCDF	7.E-11	---	3.E-12	7.E-11						
			Arsenic	9.E-07	---	5.E-08	9.E-07						
			(Total)	5.E-05	---	1.E-05	6.E-05						

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation (1)	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation (1)	Dermal	Exposure Routes Total
Groundwater	Groundwater	Tapwater	Benzene	5.E-07	---	1.E-07	7.E-07	Benzene	hematologic	6.E-01	---	2.E-01	8.E-01
			Chloromethane	3.E-08	---	3.E-10	3.E-08	Chloroethane	reproductive	9.E-04	---	2.E-05	9.E-04
			1,2-Dichloroethane	3.E-07	---	4.E-09	3.E-07	Chloromethane	central nervous	2.E-02	---	2.E-04	2.E-02
			1,1-Dichloroethene	2.E-06	---	7.E-08	2.E-06	1,1-Dichloroethane	no observed effect	2.E-02	---	4.E-04	2.E-02
			Methylene Chloride	3.E-07	---	4.E-09	3.E-07	1,1-Dichloroethene	liver	1.E-02	---	4.E-04	1.E-02
			1,1,2,2-Tetrachloroethane	5.E-07	---	1.E-08	5.E-07	1,2-Dichloroethene (cis)	liver	7.E-01	---	2.E-02	7.E-01
			Tetrachloroethene	3.E-07	---	3.E-07	6.E-07	1,2-Dichloroethene (trans)	liver	1.E-02	---	3.E-04	1.E-02
			Trichloroethene	4.E-07	---	2.E-07	6.E-07	Ethylbenzene	liver, kidney	1.E-02	---	4.E-02	5.E-02
			Vinyl Chloride	7.E-05	---	1.E-06	7.E-05	Methylene Chloride	liver	2.E-02	---	3.E-04	2.E-02
			Aldrin	4.E-07	---	2.E-09	4.E-07	Tetrachloroethene	liver	2.E-02	---	2.E-02	4.E-02
			alpha-BHC	7.E-08	---	4.E-08	1.E-07	Toluene	liver, kidney	9.E-03	---	2.E-02	3.E-02
			gamma-BHC (Lindane)	3.E-08	---	2.E-08	5.E-08	1,1,1-Trichloroethane	central nervous	1.E-01	---	4.E-03	1.E-01
			Dieldrin	3.E-07	---	1.E-08	3.E-07	Vinyl Chloride	liver	2.E-01	---	4.E-03	2.E-01
			Heptachlor	7.E-08	---	2.E-09	7.E-08	C9-C10 Aromatics	decreased body weight	3.E-01	---	6.E-02	4.E-01
			Heptachlor Epoxide	9.E-08	---	3.E-09	9.E-08	C11-C22 Aromatics	decreased body weight	1.E-01	---	4.E-01	5.E-01
			Arsenic	3.E-05	---	7.E-08	3.E-05	2-Methylnaphthalene	decreased body weight	3.E-02	---	5.E-03	3.E-02
			(Total)	1.E-04	---	2.E-06	1.E-04	Naphthalene	decreased body weight	5.E-02	---	9.E-03	6.E-02
								1,2-Dichlorobenzene	no observed effect	1.E-03	---	2.E-04	2.E-03
								Aldrin	liver	3.E-02	---	1.E-04	3.E-02
								gamma-BHC (Lindane)	liver, kidney	3.E-03	---	2.E-03	5.E-03
								Dieldrin	liver	1.E-02	---	6.E-04	1.E-02
								Heptachlor	liver	1.E-03	---	3.E-05	1.E-03
								Heptachlor Epoxide	liver	3.E-02	---	7.E-04	3.E-02
								Antimony	longevity, blood glucose, cholesterol	4.E-01	---	1.E-02	4.E-01
								Arsenic	skin, circulatory	2.E+00	---	6.E-03	2.E+00
								Barium	kidney	8.E-02	---	4.E-03	8.E-02
								Cadmium (Water)	kidney	7.E-02	---	4.E-03	7.E-02
								Chromium VI (aerosols)	no observed effect	2.E-01	---	1.E-01	3.E-01
								Manganese	central nervous	5.E+00	---	3.E-01	5.E+00
								Nitrate	circulatory	9.E-03	---	2.E-05	9.E-03
								Selenium	clinical selenosis	6.E-02	---	2.E-04	6.E-02
								(Total)		1.E+01	---	1.E+00	1.E+01

Total Risk Across Soil	6E-05
Total Risk Across Groundwater	1E-04
(2) Total Risk Across All Media and Direct Exposure Routes	2E-04
(3) Total Risk Across All Media and All Exposure Routes	2.E-04

(4) Total Hazard Index Across All Media and Direct Exposure Routes	8.E+01
(5) Total Hazard Index Across All Media and All Exposure Routes	8.E+01

(6) Total Hazard Index Divided by Target Organ

$HI_{hematologic}$	3.E+00	HI_{immune}	7.E+01
$HI_{reproductive}$	2.E+00	$HI_{gastrointestinal}$	2.E+00
$HI_{central\ nervous}$	7.E+00	HI_{skin}	4.E+00
HI_{kidney}	2.E+00	HI_{liver}	3.E+00
$HI_{circulatory}$	4.E+00		

(1) Risk from soil dust and vapor inhalation is based on modeled EPCs (see equations and text in section 3.3.6) and calculations of dose as shown in sections 3.4.6 and 3.4.7 of the Baseline Risk Assessment report.

Following USEPA Guidance, we assume that the hazard and risk from indoor inhalation of VOCs in groundwater are equal to the hazard and risk estimated for ingestion of VOCs in groundwater (USEPA Region 1 Risk Update, 1995).

(2) The "Total Risk Across All Media and Direct Exposure Routes" is the risk from the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.

(3) The "Total Risk Across All Media and All Exposure Routes" is the risk from the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.

(4) The "Total Hazard Index Across All Media and Direct Exposure Routes" is the HI for the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.

(5) The "Total Hazard Index Across All Media and All Exposure Routes" is the HI for the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.

(6) The "Total Hazard Index Across All Media and Direct Exposure Routes" is divided based on the primary target organ for each COC (see Table 16 of the Baseline Risk Assessment report).

Each COC may affect more than one target organ, thus the sum of the hazard indices by target organ does not equal the total hazard index.

TABLE 9.5.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

REASONABLE MAXIMUM EXPOSURE

Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation (1)	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation (1)	Dermal	Exposure Routes Total
Groundwater	Groundwater	Tapwater	Benzene	1.E-07	---	1.E-07	3.E-07	Benzene	hematologic	1.E-02	---	1.E-02	3.E-02
			1,2-Dichloroethane	9.E-07	---	5.E-08	1.E-06	1,2-Dichloroethene (cis)	liver	8.E-02	---	7.E-03	9.E-02
			Trichloroethene	4.E-07	---	9.E-07	1.E-06	Vinyl Chloride	liver	1.E-02	---	8.E-04	1.E-02
			Vinyl Chloride	5.E-05	---	3.E-06	5.E-05	Heptachlor	liver	9.E-05	---	9.E-06	1.E-04
			Heptachlor	7.E-08	---	7.E-09	8.E-08						
			(Total)	5.E-05	---	4.E-06	6.E-05	(Total)		1.E-01	---	2.E-02	1.E-01

Total Risk Across Groundwater	6E-05
(2) Total Risk Across All Media and Direct Exposure Routes	6E-05
(3) Total Risk Across All Media and All Exposure Routes	1.E-04

(4) Total Hazard Index Across All Media and Direct Exposure Routes	1.E-01
(5) Total Hazard Index Across All Media and All Exposure Routes	2.E-01

(1) Following USEPA Guidance, we assume that the hazard and risk from indoor inhalation of VOCs in groundwater are equal to the hazard and risk estimated for ingestion of VOCs in groundwater (USEPA Region 1 Risk Update, 1995).

(2) The "Total Risk Across All Media and Direct Exposure Routes" is the risk from the groundwater ingestion and groundwater dermal contact exposure pathways.

(3) The "Total Risk Across All Media and All Exposure Routes" is the risk from the direct exposure pathways plus the groundwater vapor inhalation pathway.

(4) The "Total Hazard Index Across All Media and Direct Exposure Routes" is the HI for the groundwater ingestion and groundwater dermal contact exposure pathways.

(5) The "Total Hazard Index Across All Media and All Exposure Routes" is the HI for the direct exposure pathways plus the groundwater vapor inhalation pathway.

TABLE 9.5.CT

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

CENTRAL TENDENCY

Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation (1)	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation (1)	Dermal	Exposure Routes Total
Groundwater	Groundwater	Tapwater	Benzene	2.E-08	---	1.E-08	3.E-08	Benzene	hematologic	7.E-03	---	4.E-03	1.E-02
			1,2-Dichloroethane	1.E-07	---	3.E-09	1.E-07	1,2-Dichloroethene (cis)	liver	4.E-02	---	2.E-03	4.E-02
			Trichloroethene	5.E-08	---	5.E-08	1.E-07	Vinyl Chloride	liver	5.E-03	---	1.E-04	5.E-03
			Vinyl Chloride	6.E-06	---	2.E-07	6.E-06	Heptachlor	liver	6.E-05	---	3.E-06	6.E-05
			Heptachlor	1.E-08	---	6.E-10	1.E-08						
			(Total)	6.E-06	---	2.E-07	6.E-06	(Total)		5.E-02	---	5.E-03	6.E-02

Total Risk Across Groundwater	6E-06
(2) Total Risk Across All Media and Direct Exposure Routes	6E-06
(3) Total Risk Across All Media and All Exposure Routes	1.E-05

(4) Total Hazard Index Across All Media and Direct Exposure Routes	6.E-02
(5) Total Hazard Index Across All Media and All Exposure Routes	1.E-01

(1) Following USEPA Guidance, we assume that the hazard and risk from indoor inhalation of VOCs in groundwater are equal to the hazard and risk estimated for ingestion of VOCs in groundwater (USEPA Region 1 Risk Update, 1995).

(2) The "Total Risk Across All Media and Direct Exposure Routes" is the risk from the groundwater ingestion and groundwater dermal contact exposure pathways.

(3) The "Total Risk Across All Media and All Exposure Routes" is the risk from the direct exposure pathways plus the groundwater vapor inhalation pathway.

(4) The "Total Hazard Index Across All Media and Direct Exposure Routes" is the HI for the groundwater ingestion and groundwater dermal contact exposure pathways.

(5) The "Total Hazard Index Across All Media and All Exposure Routes" is the HI for the direct exposure pathways plus the groundwater vapor inhalation pathway.

TABLE 9.6.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

REASONABLE MAXIMUM EXPOSURE

Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation (1)	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation (1)	Dermal	Exposure Routes Total
Groundwater	Groundwater	Tapwater	Benzene	1.E-07	---	6.E-08	2.E-07	Benzene	hematologic	5.E-02	---	3.E-02	8.E-02
			1,2-Dichloroethane	8.E-07	---	2.E-08	8.E-07	1,2-Dichloroethene (cis)	liver	3.E-01	---	1.E-02	3.E-01
			Trichloroethene	4.E-07	---	4.E-07	8.E-07	Vinyl Chloride	liver	4.E-02	---	1.E-03	4.E-02
			Vinyl Chloride	4.E-05	---	1.E-06	4.E-05	Heptachlor	liver	3.E-04	---	2.E-05	3.E-04
			Heptachlor	6.E-08	---	3.E-09	7.E-08						
			(Total)	4.E-05	---	2.E-06	5.E-05	(Total)		4.E-01	---	4.E-02	4.E-01

Total Risk Across Groundwater	5E-05
(2) Total Risk Across All Media and Direct Exposure Routes	5.E-05
(3) Total Risk Across All Media and All Exposure Routes	9.E-05

(4) Total Hazard Index Across All Media and Direct Exposure Routes	4.E-01
(5) Total Hazard Index Across All Media and All Exposure Routes	8.E-01

(1) Following USEPA Guidance, we assume that the hazard and risk from indoor inhalation of VOCs in groundwater are equal to the hazard and risk estimated for ingestion of VOCs in groundwater (USEPA Region 1 Risk Update, 1995).

(2) The "Total Risk Across All Media and Direct Exposure Routes" is the risk from the groundwater ingestion and groundwater dermal contact exposure pathways.

(3) The "Total Risk Across All Media and All Exposure Routes" is the risk from the direct exposure pathways plus the groundwater vapor inhalation pathway.

(4) The "Total Hazard Index Across All Media and Direct Exposure Routes" is the HI for the groundwater ingestion and groundwater dermal contact exposure pathways.

(5) The "Total Hazard Index Across All Media and All Exposure Routes" is the HI for the direct exposure pathways plus the groundwater vapor inhalation pathway.

TABLE 9.6.CT

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

CENTRAL TENDENCY

Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation (1)	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation (1)	Dermal	Exposure Routes Total
Groundwater	Groundwater	Tapwater	Benzene	2.E-08	---	5.E-09	2.E-08	Benzene	hematologic	2.E-02	---	6.E-03	3.E-02
			1,2-Dichloroethane	9.E-08	---	1.E-09	1.E-07	1,2-Dichloroethene (cis)	liver	1.E-01	---	3.E-03	1.E-01
			Trichloroethene	5.E-08	---	3.E-08	7.E-08	Vinyl Chloride	liver	1.E-02	---	3.E-04	1.E-02
			Vinyl Chloride	5.E-06	---	9.E-08	5.E-06	Heptachlor	liver	2.E-04	---	5.E-06	2.E-04
			Heptachlor	1.E-08	---	3.E-10	1.E-08						
			(Total)	5.E-06	---	1.E-07	5.E-06	(Total)		1.E-01	---	9.E-03	2.E-01

Total Risk Across Groundwater	5E-06
(2) Total Risk Across All Media and Direct Exposure Routes	5E-06
(3) Total Risk Across All Media and All Exposure Routes	1.E-05

(4) Total Hazard Index Across All Media and Direct Exposure Routes	2.E-01
(5) Total Hazard Index Across All Media and All Exposure Routes	3.E-01

(1) Following USEPA Guidance, we assume that the hazard and risk from indoor inhalation of VOCs in groundwater are equal to the hazard and risk estimated for ingestion of VOCs in groundwater (USEPA Region 1 Risk Update, 1995).

(2) The "Total Risk Across All Media and Direct Exposure Routes" is the risk from the groundwater ingestion and groundwater dermal contact exposure pathways.

(3) The "Total Risk Across All Media and All Exposure Routes" is the risk from the direct exposure pathways plus the groundwater vapor inhalation pathway.

(4) The "Total Hazard Index Across All Media and Direct Exposure Routes" is the HI for the groundwater ingestion and groundwater dermal contact exposure pathways.

(5) The "Total Hazard Index Across All Media and All Exposure Routes" is the HI for the direct exposure pathways plus the groundwater vapor inhalation pathway.

TABLE 9.7.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

REASONABLE MAXIMUM EXPOSURE

Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current/Future
Receptor Population: Fisherperson
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Wa	Surface Water	Kelley Brook and adjacent wetlands	Vinyl Chloride	3.E-07	---	1.E-06	1.E-06	1,2-Dichloroethene (cis)	liver	1.E-04	---	6.E-04	7.E-04
			Benz(a)anthracene	1.E-08	---	4.E-06	4.E-06	Vinyl Chloride	liver	8.E-05	---	2.E-04	3.E-04
			Benzo(a)pyrene	1.E-07	---	7.E-05	7.E-05	Heptachlor Epoxide	liver	2.E-05	---	8E-05	9.E-05
			Benzo(b)fluoranthene	1.E-08	---	6.E-06	6.E-06	Arsenic	skin, circulatory	2.E-03	---	7E-04	2.E-03
			Benzo(k)fluoranthene	1.E-09	---	5.E-07	6.E-07	Manganese	central nervous	6.E-03	---	5E-02	6.E-02
			Chrysene	1.E-10	---	4.E-08	4.E-08	Molybdenum	kidney	1.E-03	---	5.E-04	2.E-03
			Dibenz(ah)anthracene	2.E-08	---	2.E-05	2.E-05	(Total)		9.E-03	---	5.E-02	6.E-02
			Indeno(123-cd)pyrene	1.E-08	---	1.E-05	1.E-05						
			Heptachlor Epoxide	7.E-10	---	3.E-09	4.E-09						
			Arsenic	2.E-07	---	1.E-07	4.E-07						
			(Total)	8.E-07	---	1.E-04	1.E-04						
Sediment	Sediment	Kelley Brook and adjacent wetlands	Benz(a)anthracene	7.E-09	---	3.E-08	3.E-08	C11-C22 Aromatics	decreased body weight	9.E-03	---	5.E-02	6.E-02
			Benzo(a)pyrene	8.E-08	---	3.E-07	4.E-07	Polychlorinated Biphenyls	immune	4.E-02	---	2.E-01	2.E-01
			Benzo(b)fluoranthene	1.E-08	---	4.E-08	5.E-08	Arsenic	skin, circulatory	5.E-02	---	5.E-02	9.E-02
			Benzo(k)fluoranthene	9.E-10	---	4.E-09	5.E-09	Beryllium	gastrointestinal	2.E-04	---	6.E-03	6.E-03
			Chrysene	9.E-11	---	4.E-10	5.E-10	Chromium VI (particulates)	no observed effect	2.E-03	---	7.E-02	8.E-02
			Dibenz(ah)anthracene	2.E-08	---	7.E-08	9.E-08	Manganese	central nervous	4.E-02	---	3.E-01	3.E-01
			Indeno(123-cd)pyrene	5.E-09	---	2.E-08	3.E-08	Mercury	central nervous	1.E-03	---	5.E-03	6.E-03
			Polychlorinated Biphenyls	6.E-07	---	3.E-06	3.E-06	Thallium	liver	2.E-03	---	7.E-04	3.E-03
			PCB-77	8.E-09	---	3.E-08	4.E-08	(Total)		2.E-01	---	6.E-01	8.E-01
			PCB-105	1.E-08	---	5.E-08	7.E-08						
			PCB-114	6.E-09	---	2.E-08	3.E-08						
			PCB-118	2.E-08	---	9.E-08	1.E-07						
			PCB-123	7.E-09	---	3.E-08	4.E-08						
			PCB-126	2.E-07	---	9.E-07	1.E-06						
			PCB-156	3.E-08	---	1.E-07	2.E-07						
			PCB-157	3.E-09	---	1.E-08	2.E-08						
			PCB-167	1.E-09	---	5.E-09	6.E-09						
			PCB-189	9.E-10	---	4.E-09	5.E-09						
			Arsenic	7.E-06	---	7.E-06	1.E-05						
			(Total)	9.E-06	---	1.E-05	2.E-05						

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Other (Fish Tissue)	Animal Tissue	Brook Trout	Aldrin	6.E-08	---	---	6.E-08	Aldrin	liver	4.E-04	---	---	4.E-04
			4,4'-DDE	1.E-07	---	---	1.E-07	4,4'-DDE	liver	2.E-03	---	---	2.E-03
			4,4'-DDT	2.E-07	---	---	2.E-07	4,4'-DDT	liver	4.E-03	---	---	4.E-03
			Dieldrin	6.E-07	---	---	6.E-07	Dieldrin	liver	2.E-03	---	---	2.E-03
			Heptachlor Epoxide	9.E-08	---	---	9.E-08	Heptachlor Epoxide	liver	2.E-03	---	---	2.E-03
			Polychlorinated Biphenyls	3.E-05	---	---	3.E-05	Polychlorinated Biphenyls	immune	2.E+00	---	---	2.E+00
			PCB-77	1.E-07	---	---	1.E-07	Arsenic	skin, circulatory	2.E-01	---	---	2.E-01
			PCB-105	6.E-07	---	---	6.E-07	Chromium VI (particulates)	no observed effect	2.E-02	---	---	2.E-02
			PCB-118	2.E-06	---	---	2.E-06	Copper	gastrointestinal	6.E-01	---	---	6.E-01
			PCB-126	1.E-05	---	---	1.E-05	Manganese	central nervous	1.E-02	---	---	1.E-02
			PCB-156	3.E-05	---	---	3.E-05	Mercury	central nervous	3.E-01	---	---	3.E-01
			PCB-167	4.E-08	---	---	4.E-08	Zinc	decrease in ESOD	6.E-02	---	---	6.E-02
			PCB-169	7.E-08	---	---	7.E-08	(Total)		4.E+00	---	---	4.E+00
			PCB-189	2.E-07	---	---	2.E-07						
			2,3,7,8-TCDF	5.E-07	---	---	5.E-07						
			Arsenic	3.E-05	---	---	3.E-05						
			(Total)	1.E-04	---	---	1.E-04						

Total Risk Across Surface Water	1E-04
Total Risk Across Sediment	2E-05
Total Risk Across Fish Tissue	1E-04
(1) Total Risk Across All Media and All Exposure Routes	2.E-04

(2) Total Hazard Index Across All Media and All Exposure Routes	4.E+00

(3) Total Hazard Index Divided by Target Organ

$HI_{hematologic}$	NA	HI_{immune}	3.E+00
$HI_{reproductive}$	NA	$HI_{gastrointestinal}$	8.E-01
$HI_{central\ nervous}$	9.E-01	HI_{skin}	5.E-01
HI_{kidney}	2.E-01	HI_{liver}	2.E-01
$HI_{circulatory}$	5.E-01		

(1) The "Total Risk Across All Media and All Exposure Routes" is the sum of the risk from the following exposure pathways: surface water ingestion and dermal contact, sediment ingestion and dermal contact, and fish ingestion.

(2) The "Total Hazard Index Across All Media and All Exposure Routes" is the HI for the following exposure pathways: surface water ingestion and dermal contact, sediment ingestion and dermal contact, and fish ingestion.

(3) The "Total Hazard Index Across All Media and Direct Exposure Routes" is divided based on the primary target organ for each COC (see Table 16 of the Baseline Risk Assessment report).

Each COC may affect more than one target organ, thus the sum of the hazard indices by target organ does not equal the total hazard index.

NA = Not applicable because this is not a primary target organ for any of the COCs on this table.

TABLE 9.7.CT

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

CENTRAL TENDENCY

Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current/Future
Receptor Population: Fisherperson
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Surface Water	Kelley Brook and adjacent wetlands	Vinyl Chloride	1.E-08	---	2.E-08	4.E-08	1,2-Dichloroethene (cis)	circulatory system	1.E-05	---	3.E-05	4.E-05
			Benz(a)anthracene	2.E-10	---	3.E-08	3.E-08	Vinyl Chloride	liver	1.E-05	---	2.E-05	3.E-05
			Benzo(a)pyrene	2.E-09	---	5.E-07	5.E-07	Heptachlor Epoxide	liver	3.E-06	---	7E-06	1.E-05
			Benzo(b)fluoranthene	2.E-10	---	5.E-08	5.E-08	Arsenic	skin, circulatory system	3.E-04	---	6E-05	3.E-04
			Benzo(k)fluoranthene	2.E-11	---	4.E-09	4.E-09	Manganese	central nervous system	1.E-03	---	5E-03	7.E-03
			Chrysene	2.E-12	---	3.E-10	3.E-10	Molybdenum	uric acid levels	2.E-04	---	4.E-05	2.E-04
			Dibenz(ah)anthracene	4.E-10	---	2.E-07	2.E-07	(Total)		2.E-03	---	6.E-03	7.E-03
			Indeno(123-cd)pyrene	2.E-10	---	8.E-08	8.E-08						
			Heptachlor Epoxide	4.E-11	---	9.E-11	1.E-10						
			Arsenic	1.E-08	---	3.E-09	1.E-08						
			(Total)	3.E-08	---	9.E-07	1.E-06						
Sediment	Sediment	Kelley Brook and adjacent wetlands	Benz(a)anthracene	2.E-10	---	1.E-09	1.E-09	C11-C22 Aromatics	decreased body weight	2.E-03	---	2.E-02	2.E-02
			Benzo(a)pyrene	2.E-09	---	1.E-08	1.E-08	Polychlorinated Biphenyls	immune system	2.E-03	---	1.E-02	2.E-02
			Benzo(b)fluoranthene	2.E-10	---	1.E-09	2.E-09	Arsenic	skin, circulatory system	8.E-03	---	2.E-02	2.E-02
			Benzo(k)fluoranthene	2.E-11	---	1.E-10	1.E-10	Beryllium	small intestine	3.E-05	---	2.E-03	2.E-03
			Chrysene	2.E-12	---	2.E-11	2.E-11	Chromium VI (particulates)	no observed effect	4.E-04	---	3.E-02	3.E-02
			Dibenz(ah)anthracene	6.E-10	---	4.E-09	5.E-09	Manganese	central nervous system	9.E-04	---	1.E-02	1.E-02
			Indeno(123-cd)pyrene	1.E-10	---	9.E-10	1.E-09	Mercury	central nervous system	2.E-04	---	2.E-03	2.E-03
			Polychlorinated Biphenyls	3.E-09	---	3.E-08	3.E-08	Thallium	blood chemistry	1.E-04	---	8.E-05	2.E-04
			PCB-77	9.E-11	---	8.E-10	9.E-10	(Total)		1.E-02	---	9.E-02	1.E-01
			PCB-105	2.E-10	---	2.E-09	2.E-09						
			PCB-114	1.E-10	---	9.E-10	1.E-09						
			PCB-118	4.E-10	---	4.E-09	4.E-09						
			PCB-123	1.E-10	---	9.E-10	1.E-09						
			PCB-126	5.E-09	---	5.E-08	5.E-08						
			PCB-156	4.E-10	---	3.E-09	4.E-09						
			PCB-157	6.E-11	---	5.E-10	6.E-10						
			PCB-167	2.E-11	---	1.E-10	1.E-10						
			PCB-189	2.E-11	---	1.E-10	1.E-10						
			Arsenic	4.E-07	---	7.E-07	1.E-06						
			(Total)	4.E-07	---	8.E-07	1.E-06						

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Other (Fish Tissue)	Animal Tissue	Brook Trout	Aldrin	3.E-09	---	---	3.E-09	Aldrin	liver	5.E-05	---	---	5.E-05
			4,4'-DDE	1.E-08	---	---	1.E-08	4,4'-DDE	liver	6.E-04	---	---	6.E-04
			4,4'-DDT	3.E-09	---	---	3.E-09	4,4'-DDT	liver	1.E-04	---	---	1.E-04
			Dieldrin	5.E-08	---	---	5.E-08	Dieldrin	liver	6.E-04	---	---	6.E-04
			Heptachlor Epoxide	8.E-09	---	---	8.E-09	Heptachlor Epoxide	liver	7.E-04	---	---	7.E-04
			Polychlorinated Biphenyls	3.E-07	---	---	3.E-07	Polychlorinated Biphenyls	immune system	1.E-01	---	---	1.E-01
			PCB-77	1.E-08	---	---	1.E-08	Arsenic	skin, circulatory system	2.E-02	---	---	2.E-02
			PCB-105	5.E-08	---	---	5.E-08	Chromium VI (particulates)	no observed effect	6.E-03	---	---	6.E-03
			PCB-118	2.E-07	---	---	2.E-07	Copper	GI tract	9.E-03	---	---	9.E-03
			PCB-126	9.E-07	---	---	9.E-07	Manganese	central nervous system	3.E-03	---	---	3.E-03
			PCB-156	3.E-07	---	---	3.E-07	Mercury	central nervous system	1.E-01	---	---	1.E-01
			PCB-167	3.E-09	---	---	3.E-09	Zinc	circulatory system	3.E-03	---	---	3.E-03
			PCB-169	6.E-09	---	---	6.E-09	(Total)		3.E-01	---	---	3.E-01
			PCB-189	5.E-09	---	---	5.E-09						
			2,3,7,8-TCDF	3.E-08	---	---	3.E-08						
			Arsenic	7.E-07	---	---	7.E-07						
			(Total)	2.E-06	---	---	2.E-06						

Total Risk Across Surface Water	1E-06
Total Risk Across Sediment	1E-06
Total Risk Across Fish Tissue	2E-06
(1) Total Risk Across All Media and All Exposure Routes	5.E-06

(2) Total Hazard Index Across All Media and All Exposure Routes	4.E-01

(1) The "Total Risk Across All Media and All Exposure Routes" is the sum of the risk from the following exposure pathways: surface water ingestion and dermal contact, sediment ingestion and dermal contact, and fish ingestion.

(2) The "Total Hazard Index Across All Media and All Exposure Routes" is the HI for the following exposure pathways: surface water ingestion and dermal contact, sediment ingestion and dermal contact, and fish ingestion.

TABLE 9.8.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

REASONABLE MAXIMUM EXPOSURE

Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current/Future
Receptor Population: Other Recreational Person
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Surface Water	Kelley Brook and adjacent wetlands	Vinyl Chloride	4.E-07	---	2.E-06	2.E-06	1,2-Dichloroethene (cis)	liver	4.E-04	---	2.E-03	2.E-03
			Benz(a)anthracene	2.E-08	---	6.E-06	6.E-06	Vinyl Chloride	liver	2.E-04	---	7.E-04	9.E-04
			Benzo(a)pyrene	2.E-07	---	1.E-04	1.E-04	Heptachlor Epoxide	liver	4.E-05	---	2E-04	3.E-04
			Benzo(b)fluoranthene	2.E-08	---	1.E-05	1.E-05	Arsenic	skin, circulatory	4.E-03	---	2E-03	6.E-03
			Benzo(k)fluoranthene	1.E-09	---	9.E-07	9.E-07	Manganese	central nervous	2.E-02	---	2E-01	2.E-01
			Chrysene	2.E-10	---	7.E-08	7.E-08	Molybdenum	kidney	3.E-03	---	2.E-03	5.E-03
			Dibenz(ah)anthracene	3.E-08	---	3.E-05	3.E-05	(Total)		2.E-02	---	2.E-01	2.E-01
			Indeno(123-cd)pyrene	2.E-08	---	2.E-05	2.E-05						
			Heptachlor Epoxide	9.E-10	---	5.E-09	6.E-09						
			Arsenic	3.E-07	---	2.E-07	5.E-07						
			(Total)	1.E-06	---	2.E-04	2.E-04						
Sediment	Sediment	Kelley Brook and adjacent wetlands	Benz(a)anthracene	9.E-09	---	6.E-08	7.E-08	C11-C22 Aromatics	decreased body weight	2.E-02	---	2.E-01	3.E-01
			Benzo(a)pyrene	1.E-07	---	7.E-07	8.E-07	Polychlorinated Biphenyls	immune	1.E-01	---	8.E-01	1.E+00
			Benzo(b)fluoranthene	1.E-08	---	9.E-08	1.E-07	Arsenic	skin, circulatory	1.E-01	---	2.E-01	3.E-01
			Benzo(k)fluoranthene	1.E-09	---	8.E-09	1.E-08	Beryllium	gastrointestinal	5.E-04	---	3.E-02	3.E-02
			Chrysene	1.E-10	---	8.E-10	1.E-09	Chromium VI (particulates)	no observed effect	6.E-03	---	3.E-01	3.E-01
			Dibenz(ah)anthracene	3.E-08	---	2.E-07	2.E-07	Manganese	central nervous	1.E-01	---	1.E+00	1.E+00
			Indeno(123-cd)pyrene	7.E-09	---	5.E-08	6.E-08	Mercury	central nervous	3.E-03	---	2.E-02	2.E-02
			Polychlorinated Biphenyls	8.E-07	---	6.E-06	7.E-06	Thallium	liver	6.E-03	---	3.E-03	9.E-03
			PCB-77	1.E-08	---	8.E-08	9.E-08	(Total)		4.E-01	---	3.E+00	3.E+00
			PCB-105	2.E-08	---	1.E-07	1.E-07						
			PCB-114	8.E-09	---	6.E-08	6.E-08						
			PCB-118	3.E-08	---	2.E-07	2.E-07						
			PCB-123	9.E-09	---	7.E-08	8.E-08						
			PCB-126	3.E-07	---	2.E-06	2.E-06						
			PCB-156	4.E-08	---	3.E-07	4.E-07						
			PCB-157	4.E-09	---	3.E-08	3.E-08						
			PCB-167	2.E-09	---	1.E-08	1.E-08						
			PCB-189	1.E-09	---	9.E-09	1.E-08						
			Arsenic	1.E-05	---	2.E-05	3.E-05						
			(Total)	1.E-05	---	3.E-05	4.E-05						

Total Risk Across Surface Water	2E-04
Total Risk Across Sediment	4E-05
(1) Total Risk Across All Media and All Exposure Routes	2.E-04

(2) Total Hazard Index Across All Media and All Exposure Routes	3.E+00

(3) Total Hazard Index Divided by Target Organ

$HI_{hematologic}$	NA	HI_{immune}	2.E+00
$HI_{reproductive}$	NA	$HI_{gastrointestinal}$	6.E-01
$HI_{central\ nervous}$	2.E+00	HI_{skin}	9.E-01
HI_{kidney}	6.E-01	HI_{liver}	6.E-01
$HI_{circulatory}$	9.E-01		

(1) The "Total Risk Across All Media and All Exposure Routes" is the sum of the risk from surface water and sediment via ingestion and dermal contact.

(2) The "Total Hazard Index Across All Media and All Exposure Routes" is the HI for exposure to surface water and sediment via ingestion and dermal contact.

(3) The "Total Hazard Index Across All Media and Direct Exposure Routes" is divided based on the primary target organ for each COC (see Table 16 of the Baseline Risk Assessment report).

Each COC may affect more than one target organ, thus the sum of the hazard indices by target organ does not equal the total hazard index.

NA = Not applicable because this is not a primary target organ for any of the COCs on this table.

TABLE 9.8.CT

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

CENTRAL TENDENCY

Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current/Future
Receptor Population: Other Recreational Person
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Surface Water	Kelley Brook and adjacent wetlands	Vinyl Chloride	7.E-08	---	3.E-07	3.E-07	1,2-Dichloroethene (cis)	circulatory system	4.E-05	---	2.E-04	2.E-04
			Benz(a)anthracene	1.E-09	---	4.E-07	4.E-07	Vinyl Chloride	liver	3.E-05	---	1.E-04	2.E-04
			Benzo(a)pyrene	1.E-08	---	7.E-06	7.E-06	Heptachlor Epoxide	liver	1.E-05	---	5E-05	6.E-05
			Benzo(b)fluoranthene	1.E-09	---	6.E-07	6.E-07	Arsenic	skin, circulatory system	8.E-04	---	4E-04	1.E-03
			Benzo(k)fluoranthene	9.E-11	---	5.E-08	5.E-08	Manganese	central nervous system	4.E-03	---	4E-02	4.E-02
			Chrysene	1.E-11	---	4.E-09	4.E-09	Molybdenum	uric acid levels	6.E-04	---	3.E-04	8.E-04
			Dibenz(ah)anthracene	2.E-09	---	3.E-06	3.E-06	(Total)		5.E-03	---	4.E-02	5.E-02
			Indeno(123-cd)pyrene	1.E-09	---	1.E-06	1.E-06						
			Heptachlor Epoxide	2.E-10	---	1.E-09	1.E-09						
			Arsenic	6.E-08	---	3.E-08	9.E-08						
			(Total)	2.E-07	---	1.E-05	1.E-05						
Sediment	Sediment	Kelley Brook and adjacent wetlands	Benz(a)anthracene	8.E-10	---	1.E-08	1.E-08	C11-C22 Aromatics	decreased body weight	5.E-03	---	9.E-02	1.E-01
			Benzo(a)pyrene	9.E-09	---	1.E-07	1.E-07	Polychlorinated Biphenyls	immune system	5.E-03	---	7.E-02	8.E-02
			Benzo(b)fluoranthene	1.E-09	---	1.E-08	1.E-08	Arsenic	skin, circulatory system	3.E-02	---	8.E-02	1.E-01
			Benzo(k)fluoranthene	9.E-11	---	1.E-09	1.E-09	Beryllium	small intestine	1.E-04	---	1.E-02	1.E-02
			Chrysene	1.E-11	---	2.E-10	2.E-10	Chromium VI (particulates)	no observed effect	1.E-03	---	1.E-01	1.E-01
			Dibenz(ah)anthracene	3.E-09	---	4.E-08	4.E-08	Manganese	central nervous system	3.E-03	---	6.E-02	6.E-02
			Indeno(123-cd)pyrene	6.E-10	---	8.E-09	9.E-09	Mercury	central nervous system	6.E-04	---	8.E-03	9.E-03
			Polychlorinated Biphenyls	2.E-08	---	3.E-07	3.E-07	Thallium	blood chemistry	4.E-04	---	4.E-04	8.E-04
			PCB-77	5.E-10	---	7.E-09	7.E-09	(Total)		4.E-02	---	5.E-01	5.E-01
			PCB-105	1.E-09	---	2.E-08	2.E-08						
			PCB-114	5.E-10	---	8.E-09	8.E-09						
			PCB-118	2.E-09	---	3.E-08	3.E-08						
			PCB-123	6.E-10	---	8.E-09	8.E-09						
			PCB-126	3.E-08	---	4.E-07	4.E-07						
			PCB-156	2.E-09	---	3.E-08	3.E-08						
			PCB-157	3.E-10	---	5.E-09	5.E-09						
			PCB-167	8.E-11	---	1.E-09	1.E-09						
			PCB-189	8.E-11	---	1.E-09	1.E-09						
			Arsenic	2.E-06	---	6.E-06	8.E-06						
			(Total)	2.E-06	---	7.E-06	1.E-05						
						Total Risk Across Surface Water	1E-05		(2) Total Hazard Index Across All Media and All Exposure Routes				5.E-01
						Total Risk Across Sediment	1E-05						
						(1) Total Risk Across All Media and All Exposure Routes	2.E-05						

(1) The "Total Risk Across All Media and All Exposure Routes" is the sum of the risk from surface water and sediment via ingestion and dermal contact.

(2) The "Total Hazard Index Across All Media and All Exposure Routes" is the HI for exposure to surface water and sediment via ingestion and dermal contact.

TABLE 9.9.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

REASONABLE MAXIMUM EXPOSURE

Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current
Receptor Population: Trespasser
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation (1)	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation (1)	Dermal	Exposure Routes Total
Soil	Surface soil	0 to 1 foot soil	Tetrachloroethene	1.E-08	---	---	1.E-08	1,2-Dichloroethene (cis)	liver	3.E-07	---	---	3.E-07
			Benz(a)anthracene	3.E-07	---	1.E-07	4.E-07	Tetrachloroethene	liver	2.E-04	---	---	2.E-04
			Benzo(a)pyrene	2.E-06	---	5.E-07	2.E-06	C9-C18 Aliphatics	liver , hematologic	3E-02	---	2E-02	5.E-02
			Benzo(b)fluoranthene	1.E-07	---	3.E-08	1.E-07	C11-C22 Aromatics	decreased body weight	2E-01	---	8E-02	3.E-01
			Benzo(k)fluoranthene	1.E-08	---	5.E-09	2.E-08	Naphthalene	decreased body weight	2E-05	---	5E-05	7.E-05
			Chrysene	2.E-09	---	6.E-10	2.E-09	bis(2-Ethylhexyl)phthalate	liver	4.E-03	---	1.E-03	6.E-03
			Dibenz(ah)anthracene	2.E-07	---	7.E-08	3.E-07	Polychlorinated Biphenyls	immune	1.E+01	---	4.E+00	2.E+01
			Indeno(123-cd)pyrene	6.E-08	---	2.E-08	7.E-08	Antimony	longevity, blood glucose, cholesterol	1.E-03	---	3.E-04	1.E-03
			bis(2-Ethylhexyl)phthalate	2.E-07	---	7.E-08	3.E-07	Arsenic	skin, circulatory	2.E-02	---	1.E-03	2.E-02
			Polychlorinated Biphenyls	8.E-05	---	3.E-05	1.E-04	Barium	kidney	3.E-02	---	2.E-02	5.E-02
			PCB-77	5.E-06	---	2.E-06	7.E-06	Beryllium	gastrointestinal	1.E-04	---	3.E-04	4.E-04
			PCB-81	2.E-07	---	6.E-08	2.E-07	Cadmium (Food)	kidney	2.E-02	---	2.E-02	3.E-02
			PCB-105	8.E-06	---	3.E-06	1.E-05	Chromium VI (particulates)	no observed effect	1.E-01	---	3.E-01	4.E-01
			PCB-114	4.E-06	---	1.E-06	5.E-06	Copper	gastrointestinal	4.E-04	---	2.E-05	4.E-04
			PCB-118	1.E-05	---	4.E-06	2.E-05	Manganese	central nervous	2.E-03	---	1.E-03	4.E-03
			PCB-123	1.E-06	---	4.E-07	2.E-06	Mercury	central nervous	2.E-03	---	7.E-04	3.E-03
			PCB-126	5.E-05	---	2.E-05	6.E-05	Molybdenum	kidney	5.E-04	---	1.E-05	5.E-04
			PCB-156	2.E-06	---	6.E-07	3.E-06	Nickel	decreased body and organ weights	3.E-02	---	8.E-02	1.E-01
			PCB-157	5.E-07	---	2.E-07	6.E-07	Vanadium	decreased hair cystine	2.E-03	---	2.E-03	3.E-03
			PCB-167	7.E-08	---	2.E-08	1.E-07	Zinc	decrease in ESOD	4.E-03	---	4.E-04	4.E-03
			PCB-189	1.E-08	---	5.E-09	2.E-08	(Total)		1.E+01	---	5.E+00	2.E+01

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation (1)	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation (1)	Dermal	Exposure Routes Total
			2,3,7,8-TCDD	7.E-09	---	5.E-10	7.E-09						
			1,2,3,7,8-PeCDD	6.E-08	---	5.E-09	7.E-08						
			1,2,3,4,7,8-HxCDD	9.E-09	---	6.E-10	9.E-09						
			1,2,3,6,7,8-HxCDD	2.E-08	---	2.E-09	2.E-08						
			1,2,3,7,8,9-HxCDD	2.E-08	---	1.E-09	2.E-08						
			1,2,3,4,6,7,8-HpCDD	4.E-08	---	3.E-09	5.E-08						
			OCDD	3.E-09	---	3.E-10	4.E-09						
			2,3,7,8-TCDF	1.E-07	---	7.E-09	1.E-07						
			1,2,3,7,8-PeCDF	2.E-08	---	1.E-09	2.E-08						
			2,3,4,7,8-PeCDF	1.E-06	---	9.E-08	1.E-06						
			1,2,3,4,7,8-HxCDF	6.E-08	---	4.E-09	6.E-08						
			1,2,3,6,7,8-HxCDF	3.E-08	---	2.E-09	4.E-08						
			1,2,3,7,8,9-HxCDF	2.E-08	---	1.E-09	2.E-08						
			2,3,4,6,7,8-HxCDF	4.E-08	---	3.E-09	4.E-08						
			1,2,3,4,6,7,8-HpCDF	1.E-08	---	8.E-10	1.E-08						
			1,2,3,4,7,8,9-HpCDF	1.E-09	---	1.E-10	1.E-09						
			OCDF	2.E-10	---	1.E-11	2.E-10						
			Arsenic	1.E-06	---	9.E-08	1.E-06						
			(Total)	2.E-04	---	6.E-05	2.E-04						

Total Risk Across Soil	2E-04
(2) Total Risk Across All Media and Direct Exposure Routes	2.E-04
(3) Total Risk Across All Media and All Exposure Routes	2.E-04

(4) Total Hazard Index Across All Media and Direct Exposure Routes	2.E+01
(5) Total Hazard Index Across All Media and All Exposure Routes	2.E+01

(6) Total Hazard Index Divided by Target Organ

$HI_{hematologic}$	8.E-01	HI_{immune}	2.E+01
$HI_{reproductive}$	NA	$HI_{gastrointestinal}$	8.E-01
$HI_{central\ nervous}$	8.E-01	HI_{skin}	8.E-01
HI_{kidney}	9.E-01	HI_{liver}	8.E-01
$HI_{circulatory}$	8.E-01		

(1) Risk from soil dust and vapor inhalation is based on modeled EPCs (see equations and text in section 3.3.6) and calculations of dose as shown in sections 3.4.6 and 3.4.7 of the Baseline Risk Assessment report.

(2) The "Total Risk Across All Media and Direct Exposure Routes" is the sum of the risk from the soil ingestion and soil dermal contact pathways.

(3) The "Total Risk Across All Media and All Exposure Routes" is the sum of the risk from the direct exposure pathways plus the soil dust and vapor inhalation pathways.

(4) The "Total Hazard Index Across All Media and Direct Exposure Routes" is the HI for exposure to soil via ingestion and dermal contact.

(5) The "Total Hazard Index Across All Media and All Exposure Routes" is the HI for the direct exposure pathways plus the soil dust and vapor inhalation pathways.

(6) The "Total Hazard Index Across All Media and Direct Exposure Routes" is divided based on the primary target organ for each COC (see Table 16 of the Baseline Risk Assessment report).

Each COC may affect more than one target organ, thus the sum of the hazard indices by target organ does not equal the total hazard index.

NA = Not applicable because this is not a primary target organ for any of the COCs on this table.

TABLE 9.9.CT

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

CENTRAL TENDENCY

Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current
Receptor Population: Trespasser
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation (1)	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation (1)	Dermal	Exposure Routes Total
Soil	Surface soil	0 to 1 foot soil	Tetrachloroethene	2.E-10	---	---	2.E-10	1,2-Dichloroethene (cis)	liver	5.E-08	---	---	5.E-08
			Benz(a)anthracene	6.E-08	---	6.E-09	7.E-08	Tetrachloroethene	liver	2.E-06	---	---	2.E-06
			Benzo(a)pyrene	8.E-08	---	7.E-09	9.E-08	C9-C18 Aliphatics	liver , hematologic	6E-04	---	9E-05	7.E-04
			Benzo(b)fluoranthene	2.E-08	---	2.E-09	2.E-08	C11-C22 Aromatics	decreased body weight	4E-03	---	5E-04	4.E-03
			Benzo(k)fluoranthene	7.E-10	---	7.E-11	8.E-10	Naphthalene	decreased body weight	5E-07	---	3E-07	8.E-07
			Chrysene	4.E-10	---	3.E-11	4.E-10	bis(2-Ethylhexyl)phthalate	liver	2.E-04	---	1.E-05	2.E-04
			Dibenz(ah)anthracene	5.E-08	---	4.E-09	5.E-08	Polychlorinated Biphenyls	immune	3.E+00	---	2.E-01	3.E+00
			Indeno(123-cd)pyrene	1.E-08	---	1.E-09	1.E-08	Antimony	longevity, blood glucose, cholesterol	2.E-04	---	1.E-05	2.E-04
			bis(2-Ethylhexyl)phthalate	7.E-09	---	7.E-10	8.E-09	Arsenic	skin, circulatory	3.E-03	---	7.E-05	3.E-03
			Polychlorinated Biphenyls	8.E-06	---	8.E-07	9.E-06	Barium	kidney	3.E-04	---	4.E-05	3.E-04
			PCB-77	3.E-07	---	2.E-08	3.E-07	Beryllium	gastrointestinal	2.E-05	---	2.E-05	4.E-05
			PCB-81	1.E-08	---	1.E-09	1.E-08	Cadmium (Food)	kidney	1.E-04	---	4.E-05	2.E-04
			PCB-105	3.E-07	---	3.E-08	4.E-07	Chromium VI (particulates)	no observed effect	1.E-03	---	1.E-03	2.E-03
			PCB-114	2.E-07	---	2.E-08	2.E-07	Copper	gastrointestinal	7.E-05	---	1.E-06	7.E-05
			PCB-118	6.E-07	---	6.E-08	6.E-07	Manganese	central nervous	2.E-04	---	3.E-05	2.E-04
			PCB-123	6.E-08	---	6.E-09	7.E-08	Mercury	central nervous	4.E-04	---	4.E-05	4.E-04
			PCB-126	3.E-06	---	3.E-07	3.E-06	Molybdenum	kidney	1.E-04	---	7.E-07	1.E-04
			PCB-156	1.E-07	---	1.E-08	1.E-07	Nickel	decreased body and organ weights	3.E-04	---	2.E-04	4.E-04
			PCB-157	2.E-08	---	2.E-09	2.E-08	Vanadium	decreased hair cystine	3.E-04	---	1.E-04	4.E-04
			PCB-167	4.E-09	---	4.E-10	4.E-09	Zinc	decrease in ESOD	4.E-05	---	1.E-06	5.E-05
			PCB-189	3.E-09	---	3.E-10	3.E-09	(Total)		3.E+00	---	3.E-01	3.E+00

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation (1)	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation (1)	Dermal	Exposure Routes Total
			2,3,7,8-TCDD	1.E-09	---	2.E-11	1.E-09						
			1,2,3,7,8-PeCDD	6.E-09	---	1.E-10	6.E-09						
			1,2,3,4,7,8-HxCDD	1.E-09	---	2.E-11	1.E-09						
			1,2,3,6,7,8-HxCDD	3.E-09	---	6.E-11	3.E-09						
			1,2,3,7,8,9-HxCDD	2.E-09	---	4.E-11	2.E-09						
			1,2,3,4,6,7,8-HpCDD	4.E-09	---	9.E-11	5.E-09						
			OCDD	3.E-10	---	7.E-12	4.E-10						
			2,3,7,8-TCDF	7.E-09	---	1.E-10	7.E-09						
			1,2,3,7,8-PeCDF	1.E-09	---	3.E-11	1.E-09						
			2,3,4,7,8-PeCDF	9.E-08	---	2.E-09	1.E-07						
			1,2,3,4,7,8-HxCDF	5.E-09	---	1.E-10	5.E-09						
			1,2,3,6,7,8-HxCDF	3.E-09	---	6.E-11	3.E-09						
			1,2,3,7,8,9-HxCDF	1.E-09	---	3.E-11	2.E-09						
			2,3,4,6,7,8-HxCDF	3.E-09	---	7.E-11	4.E-09						
			1,2,3,4,6,7,8-HpCDF	1.E-09	---	2.E-11	1.E-09						
			1,2,3,4,7,8,9-HpCDF	1.E-10	---	3.E-12	1.E-10						
			OCDF	2.E-11	---	4.E-13	2.E-11						
			Arsenic	2.E-07	---	5.E-09	2.E-07						
			(Total)	1.E-05	---	1.E-06	1.E-05						

Total Risk Across Soil	1E-05
(2) Total Risk Across All Media and Direct Exposure Routes	1.E-05
(3) Total Risk Across All Media and All Exposure Routes	1.E-05

(4) Total Hazard Index Across All Media and Direct Exposure Routes	3.E+00
(5) Total Hazard Index Across All Media and All Exposure Routes	3.E+00

(6) Total Hazard Index Divided by Target Organ

$HI_{hematologic}$	9.E-03	HI_{immune}	3.E+00
$HI_{reproductive}$	NA	$HI_{gastrointestinal}$	8.E-03
$HI_{central\ nervous}$	9.E-03	HI_{skin}	1.E-02
HI_{kidney}	8.E-03	HI_{liver}	9.E-03
$HI_{circulatory}$	1.E-02		

(1) Risk from soil dust and vapor inhalation is based on modeled EPCs (see equations and text in section 3.3.6) and calculations of dose as shown in sections 3.4.6 and 3.4.7 of the Baseline Risk Assessment report.

(2) The "Total Risk Across All Media and Direct Exposure Routes" is the sum of the risk from the soil ingestion and soil dermal contact pathways.

(3) The "Total Risk Across All Media and All Exposure Routes" is the sum of the risk from the direct exposure pathways plus the soil dust and vapor inhalation pathways.

(4) The "Total Hazard Index Across All Media and Direct Exposure Routes" is the HI for exposure to soil via ingestion and dermal contact.

(5) The "Total Hazard Index Across All Media and All Exposure Routes" is the HI for the direct exposure pathways plus the soil dust and vapor inhalation pathways.

(6) The "Total Hazard Index Across All Media and Direct Exposure Routes" is divided based on the primary target organ for each COC (see Table 16 of the Baseline Risk Assessment report).

Each COC may affect more than one target organ, thus the sum of the hazard indices by target organ does not equal the total hazard index.

NA = Not applicable because this is not a primary target organ for any of the COCs on this table.

TABLE 9.10.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation (1)	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation (1)	Dermal	Exposure Routes Total
Soil	Surface and subsurface soil	0 to 10 foot soil	Tetrachloroethene	3.E-10	---	---	3.E-10	1,2-Dichloroethene (cis)	liver	3.E-04	---	---	3.E-04
			Benz(a)anthracene	3.E-08	---	5.E-09	3.E-08	Tetrachloroethene	liver	4.E-06	---	---	4.E-06
			Benzo(a)pyrene	6.E-07	---	1.E-07	7.E-07	C9-C18 Aliphatics	liver , hematologic	3.E-02	---	9E-03	4.E-02
			Benzo(b)fluoranthene	2.E-08	---	3.E-09	2.E-08	C11-C22 Aromatics	decreased body weight	6.E-02	---	2E-02	8.E-02
			Benzo(k)fluoranthene	5.E-09	---	1.E-09	6.E-09	Naphthalene	decreased body weight	1.E-04	---	2E-04	3.E-04
			Chrysene	2.E-10	---	4.E-11	3.E-10	bis(2-Ethylhexyl)phthalate	reproductive	5.E-03	---	9.E-04	6.E-03
			Dibenz(ah)anthracene	6.E-08	---	1.E-08	8.E-08	Polychlorinated Biphenyls	immune	1.E+01	---	3.E+00	2.E+01
			Indeno(123-cd)pyrene	1.E-08	---	2.E-09	1.E-08	Antimony	longevity, blood glucose, cholesterol	5.E-03	---	8.E-04	6.E-03
			bis(2-Ethylhexyl)phthalate	2.E-08	---	4.E-09	2.E-08	Arsenic	skin, circulatory	6.E-02	---	3.E-03	6.E-02
			Polychlorinated Biphenyls	6.E-06	---	1.E-06	8.E-06	Barium	kidney	3.E-03	---	1.E-03	4.E-03
			PCB-77	2.E-06	---	4.E-07	2.E-06	Beryllium	gastrointestinal	3.E-03	---	4.E-03	6.E-03
			PCB-81	3.E-08	---	7.E-09	4.E-08	Cadmium (Food)	kidney	1.E-01	---	8.E-02	2.E-01
			PCB-105	1.E-06	---	3.E-07	2.E-06	Chromium VI (particulates)	no observed effect	7.E-02	---	1.E-01	2.E-01
			PCB-114	4.E-07	---	9.E-08	5.E-07	Mercury	central nervous	7.E-01	---	1.E-01	8.E-01
			PCB-118	2.E-06	---	4.E-07	2.E-06	Nickel	decreased body and organ weights	1.E-01	---	2.E-01	3.E-01
			PCB-123	1.E-07	---	2.E-08	1.E-07	Zinc	decrease in ESOD	1.E-03	---	7.E-05	1.E-03
			PCB-126	5.E-06	---	1.E-06	6.E-06	(Total)		1.E+01	---	4.E+00	2.E+01
			PCB-156	2.E-07	---	3.E-08	2.E-07						
			PCB-157	3.E-08	---	7.E-09	4.E-08						
			PCB-167	5.E-09	---	1.E-09	6.E-09						
			PCB-189	2.E-13	---	4.E-10	4.E-10						
			2,3,7,8-TCDD	2.E-09	---	1.E-10	2.E-09						
			1,2,3,7,8-PeCDD	2.E-08	---	1.E-09	2.E-08						
			1,2,3,4,7,8-HxCDD	3.E-09	---	1.E-10	3.E-09						
			1,2,3,6,7,8-HxCDD	7.E-09	---	3.E-10	8.E-09						
			1,2,3,7,8,9-HxCDD	6.E-09	---	3.E-10	6.E-09						
			1,2,3,4,6,7,8-HpCDD	2.E-08	---	7.E-10	2.E-08						
			OCDD	1.E-09	---	6.E-11	1.E-09						
			2,3,7,8-TCDF	4.E-08	---	2.E-09	4.E-08						
			1,2,3,7,8-PeCDF	7.E-09	---	3.E-10	7.E-09						
			2,3,4,7,8-PeCDF	4.E-07	---	2.E-08	4.E-07						
			1,2,3,4,7,8-HxCDF	2.E-08	---	9.E-10	2.E-08						
			1,2,3,6,7,8-HxCDF	1.E-08	---	5.E-10	1.E-08						
			1,2,3,7,8,9-HxCDF	7.E-09	---	3.E-10	7.E-09						
			2,3,4,6,7,8-HxCDF	1.E-08	---	6.E-10	1.E-08						
			1,2,3,4,6,7,8-HpCDF	4.E-09	---	2.E-10	4.E-09						
			1,2,3,4,7,8,9-HpCDF	5.E-10	---	2.E-11	5.E-10						
			OCDF	6.E-11	---	3.E-12	6.E-11						
			Arsenic	4.E-07	---	2.E-08	4.E-07						
			(Total)	2.E-05	---	4.E-06	2.E-05						

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation (1)	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation (1)	Dermal	Exposure Routes Total
Groundwater	Groundwater	Excavation Site	Benzene	3.E-08	---	8.E-06	8.E-06	Benzene	hematologic	7.E-02	---	2.E+01	2.E+01
			1,1-Dichloroethene	2.E-08	---	8.E-07	8.E-07	Chloroethane	reproductive	2.E-06	---	1.E-03	1.E-03
			1,1,2,2-Tetrachloroethane	2.E-09	---	4.E-08	4.E-08	1,1-Dichloroethane	no observed effect	9.E-05	---	2.E-03	2.E-03
			Tetrachloroethene	5.E-09	---	5.E-06	5.E-06	1,1-Dichloroethene	liver	3.E-04	---	1.E-02	1.E-02
			Trichloroethene	6.E-10	---	4.E-07	4.E-07	1,2-Dichloroethene (cis)	liver	7.E-03	---	2.E-01	2.E-01
			Vinyl Chloride	8.E-06	---	1.E-04	1.E-04	1,2-Dichloroethene (trans)	liver	1.E-04	---	4.E-03	4.E-03
			Arsenic	2.E-07	---	5.E-07	6.E-07	Ethylbenzene	liver, kidney	3.E-03	---	8.E+00	8.E+00
			(Total)	8.E-06	---	2.E-04	2.E-04	Tetrachloroethene	liver	7.E-05	---	7.E-02	7.E-02
								Toluene	liver, kidney	7.E-05	---	2.E-01	2.E-01
								1,1,1-Trichloroethane	central nervous	9.E-04	---	4.E-02	4.E-02
								Vinyl Chloride	liver	4.E-02	---	8.E-01	8.E-01
								Naphthalene	decreased body weight	2.E-03	---	4.E-01	4.E-01
								1,2-Dichlorobenzene	no observed effect	7.E-05	---	1.E-02	1.E-02
								Arsenic	skin, circulatory	3.E-02	---	7.E-02	1.E-01
								Manganese	central nervous	5.E-02	---	3.E+00	3.E+00
								Nitrate	circulatory	7.E-05	---	2.E-04	2.E-04
								(Total)		2.E-01	---	3.E+01	3.E+01

Total Risk Across Soil	2E-05
Total Risk Across Groundwater	2E-04
(2) Total Risk Across All Media and Direct Exposure Routes	2.E-04
(3) Total Risk Across All Media and All Exposure Routes	2.E-04

(4) Total Hazard Index Across All Media and Direct Exposure Routes	5.E+01
(5) Total Hazard Index Across All Media and All Exposure Routes	5.E+01

(6) Total Hazard Index Divided by Target Organ

$HI_{hematologic}$	2.E+01	HI_{immune}	2.E+01
$HI_{reproductive}$	1.E+00	$HI_{gastrointestinal}$	1.E+00
$HI_{central\ nervous}$	5.E+00	HI_{skin}	1.E+00
HI_{kidney}	9.E+00	HI_{liver}	1.E+01
$HI_{circulatory}$	1.E+00		

(1) Risk from soil dust and vapor inhalation is based on modeled EPCs (see equations and text in section 3.3.6) and calculations of dose as shown in sections 3.4.6 and 3.4.7 of the Baseline Risk Assessment report.

(2) The "Total Risk Across All Media and Direct Exposure Routes" is the risk from the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.

(3) The "Total Risk Across All Media and All Exposure Routes" is the risk from the direct exposure pathways, plus the soil dust and vapor inhalation pathways.

(4) The "Total Hazard Index Across All Media and Direct Exposure Routes" is the HI for the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.

(5) The "Total Hazard Index Across All Media and All Exposure Routes" is the HI for the direct exposure pathways, plus the soil dust and vapor inhalation pathways.

(6) The "Total Hazard Index Across All Media and Direct Exposure Routes" is divided based on the primary target organ for each COC (see Table 16 of the Baseline Risk Assessment report).

Each COC may affect more than one target organ, thus the sum of the hazard indices by target organ does not equal the total hazard index.

TABLE 9.10.CT

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

CENTRAL TENDENCY

Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation (1)	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation (1)	Dermal	Exposure Routes Total
Soil	Surface and subsurface soil	0 to 10 foot soil	Tetrachloroethene	2.E-10	---	---	2.E-10	1,2-Dichloroethene (cis)	liver	3.E-06	---	---	3.E-06
			Benz(a)anthracene	2.E-08	---	3.E-09	2.E-08	Tetrachloroethene	liver	2.E-06	---	---	2.E-06
			Benzo(a)pyrene	7.E-08	---	1.E-08	8.E-08	C9-C18 Aliphatics	liver , hematologic	2.E-02	---	6E-03	2.E-02
			Benzo(b)fluoranthene	1.E-08	---	2.E-09	1.E-08	C11-C22 Aromatics	decreased body weight	4.E-02	---	1E-02	5.E-02
			Benzo(k)fluoranthene	6.E-10	---	1.E-10	7.E-10	Naphthalene	decreased body weight	7.E-05	---	1E-04	2.E-04
			Chrysene	1.E-10	---	3.E-11	2.E-10	bis(2-Ethylhexyl)phthalate	reproductive	3.E-03	---	6.E-04	3.E-03
			Dibenz(ah)anthracene	4.E-08	---	8.E-09	5.E-08	Polychlorinated Biphenyls	immune	8.E+00	---	2.E+00	1.E+01
			Indeno(123-cd)pyrene	6.E-09	---	1.E-09	8.E-09	Antimony	longevity, blood glucose, cholesterol	3.E-03	---	5.E-04	4.E-03
			bis(2-Ethylhexyl)phthalate	1.E-08	---	2.E-09	1.E-08	Arsenic	skin, circulatory	4.E-02	---	2.E-03	4.E-02
			Polychlorinated Biphenyls	2.E-06	---	4.E-07	2.E-06	Barium	kidney	2.E-03	---	6.E-04	2.E-03
			PCB-77	1.E-07	---	2.E-08	1.E-07	Beryllium	gastrointestinal	3.E-04	---	5.E-04	9.E-04
			PCB-81	2.E-08	---	4.E-09	2.E-08	Cadmium (Food)	kidney	2.E-03	---	1.E-03	4.E-03
			PCB-105	8.E-07	---	2.E-07	1.E-06	Chromium VI (particulates)	no observed effect	2.E-03	---	3.E-03	6.E-03
			PCB-114	3.E-07	---	5.E-08	3.E-07	Mercury	central nervous	1.E-01	---	2.E-02	1.E-01
			PCB-118	1.E-06	---	3.E-07	1.E-06	Nickel	decreased body and organ weights	2.E-03	---	3.E-03	5.E-03
			PCB-123	7.E-08	---	1.E-08	8.E-08	Zinc	decrease in ESOD	7.E-04	---	4.E-05	8.E-04
			PCB-126	3.E-06	---	6.E-07	3.E-06	(Total)		8.E+00	---	2.E+00	1.E+01
			PCB-156	9.E-08	---	2.E-08	1.E-07						
			PCB-157	2.E-08	---	4.E-09	2.E-08						
			PCB-167	3.E-09	---	7.E-10	4.E-09						
			PCB-189	1.E-13	---	2.E-10	2.E-10						
			2,3,7,8-TCDD	1.E-09	---	5.E-11	1.E-09						
			1,2,3,7,8-PeCDD	7.E-09	---	3.E-10	7.E-09						
			1,2,3,4,7,8-HxCDD	1.E-09	---	5.E-11	1.E-09						
			1,2,3,6,7,8-HxCDD	3.E-09	---	1.E-10	3.E-09						
			1,2,3,7,8,9-HxCDD	2.E-09	---	9.E-11	2.E-09						
			1,2,3,4,6,7,8-HpCDD	5.E-09	---	2.E-10	5.E-09						
			OCDD	4.E-10	---	2.E-11	4.E-10						
			2,3,7,8-TCDF	7.E-09	---	3.E-10	8.E-09						
			1,2,3,7,8-PeCDF	1.E-09	---	6.E-11	1.E-09						
			2,3,4,7,8-PeCDF	1.E-07	---	5.E-09	1.E-07						
			1,2,3,4,7,8-HxCDF	5.E-09	---	2.E-10	6.E-09						
			1,2,3,6,7,8-HxCDF	3.E-09	---	1.E-10	3.E-09						
			1,2,3,7,8,9-HxCDF	2.E-09	---	7.E-11	2.E-09						
			2,3,4,6,7,8-HxCDF	4.E-09	---	2.E-10	4.E-09						
			1,2,3,4,6,7,8-HpCDF	1.E-09	---	6.E-11	1.E-09						
			1,2,3,4,7,8,9-HpCDF	1.E-10	---	6.E-12	1.E-10						
			OCDF	2.E-11	---	9.E-13	2.E-11						
			Arsenic	2.E-07	---	1.E-08	3.E-07						
			(Total)	8.E-06	---	2.E-06	9.E-06						

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation (1)	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation (1)	Dermal	Exposure Routes Total
Groundwater	Groundwater	Excavation Site	Benzene	2.E-09	---	4.E-07	4.E-07	Benzene	hematologic	5.E-03	---	9.E-01	9.E-01
			1,1-Dichloroethene	3.E-09	---	9.E-08	9.E-08	Chloroethane	reproductive	2.E-07	---	5.E-05	5.E-05
			1,1,2,2-Tetrachloroethane	1.E-09	---	1.E-08	2.E-08	1,1-Dichloroethane	no observed effect	7.E-06	---	1.E-04	1.E-04
			Tetrachloroethene	5.E-10	---	3.E-07	3.E-07	1,1-Dichloroethene	liver	4.E-05	---	1.E-03	1.E-03
			Trichloroethene	8.E-11	---	3.E-08	3.E-08	1,2-Dichloroethene (cis)	liver	5.E-04	---	9.E-03	1.E-02
			Vinyl Chloride	5.E-07	---	6.E-06	6.E-06	1,2-Dichloroethene (trans)	liver	1.E-05	---	2.E-04	2.E-04
			Arsenic	4.E-08	---	7.E-08	1.E-07	Ethylbenzene	liver, kidney	2.E-04	---	4.E-01	4.E-01
			(Total)	5.E-07	---	7.E-06	7.E-06	Tetrachloroethene	liver	7.E-06	---	4.E-03	4.E-03
								Toluene	liver, kidney	4.E-06	---	7.E-03	7.E-03
								1,1,1-Trichloroethane	central nervous	8.E-05	---	2.E-03	2.E-03
								Vinyl Chloride	liver	3.E-03	---	3.E-02	4.E-02
								Naphthalene	decreased body weight	3.E-04	---	3.E-02	3.E-02
								1,2-Dichlorobenzene	no observed effect	7.E-06	---	7.E-04	7.E-04
								Arsenic	skin, circulatory	6.E-03	---	1.E-02	2.E-02
								Manganese	central nervous	3.E-02	---	9.E-01	9.E-01
								Nitrate	circulatory	1.E-05	---	2.E-05	4.E-05
								(Total)		4.E-02	---	2.E+00	2.E+00

Total Risk Across Soil	9E-06
Total Risk Across Groundwater	7E-06
(2) Total Risk Across All Media and Direct Exposure Routes	2.E-05
(3) Total Risk Across All Media and All Exposure Routes	2E-05

(4) Total Hazard Index Across All Media and Direct Exposure Routes	1.E+01
(5) Total Hazard Index Across All Media and All Exposure Routes	1.E+01

(6) Total Hazard Index Divided by Target Organ

$HI_{hematologic}$	1.E+00	HI_{immune}	1.E+01
$HI_{reproductive}$	1.E-01	$HI_{gastrointestinal}$	1.E-01
$HI_{central\ nervous}$	1.E+00	HI_{skin}	2.E-01
HI_{kidney}	5.E-01	HI_{liver}	5.E-01
$HI_{circulatory}$	2.E-01		

(1) Risk from soil dust and vapor inhalation is based on modeled EPCs (see equations and text in section 3.3.6) and calculations of dose as shown in sections 3.4.6 and 3.4.7 of the Baseline Risk Assessment report.

(2) The "Total Risk Across All Media and Direct Exposure Routes" is the risk from the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.

(3) The "Total Risk Across All Media and All Exposure Routes" is the risk from the direct exposure pathways, plus the soil dust and vapor inhalation pathways.

(4) The "Total Hazard Index Across All Media and Direct Exposure Routes" is the HI for the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.

(5) The "Total Hazard Index Across All Media and All Exposure Routes" is the HI for the direct exposure pathways, plus the soil dust and vapor inhalation pathways.

(6) The "Total Hazard Index Across All Media and Direct Exposure Routes" is divided based on the primary target organ for each COC (see Table 16 of the Baseline Risk Assessment report).

Each COC may affect more than one target organ, thus the sum of the hazard indices by target organ does not equal the total hazard index.

APPENDIX Q

RAGS PART D TABLE 10 SERIES:

RISK ASSESSMENT SUMMARY

TABLE 10.1.RME

RISK ASSESSMENT SUMMARY

REASONABLE MAXIMUM EXPOSURE

Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation (1)	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation (1)	Dermal	Exposure Routes Total
Soil	Surface and subsurface soil	0 to 10 foot soil	Benzo(a)pyrene	3.E-06	---	2.E-06	5.E-06	Polychlorinated Biphenyls	immune	3.E+00	---	2.E+00	5.E+00
			Polychlorinated Biphenyls	3.E-05	---	2.E-05	5.E-05	(Total)		3.E+00	---	2.E+00	6.E+00
			PCB-77	1.E-05	---	5.E-06	2.E-05						
			PCB-105	7.E-06	---	4.E-06	1.E-05						
			PCB-114	2.E-06	---	1.E-06	4.E-06						
			PCB-118	1.E-05	---	6.E-06	2.E-05						
			PCB-126	2.E-05	---	1.E-05	4.E-05						
			PCB-156	8.E-07	---	4.E-07	1.E-06						
			2,3,4,7,8-PeCDF	2.E-06	---	3.E-07	3.E-06						
			Arsenic	2.E-06	---	3.E-07	2.E-06						
			(Total)	1.E-04	---	5.E-05	2.E-04						
Groundwater	Groundwater	Tapwater	Benzene	7.E-05	---	7.E-05	1.E-04	Benzene	hematologic	7.E+00	---	7.E+00	1.E+01
			1,2-Dichloroethane	2.E-05	---	7.E-07	2.E-05	1,2-Dichloroethene (cis)	liver	7.E+00	---	6.E-01	7.E+00
			1,1-Dichloroethene	7.E-05	---	1.E-05	8.E-05	Ethylbenzene	liver, kidney	3.E-01	---	2.E+00	3.E+00
			Methylene Chloride	1.E-04	---	5.E-06	1.E-04	1,1,1-Trichloroethane	central nervous	9.E-01	---	1.E-01	1.E+00
			1,1,2,2-Tetrachloroethane	4.E-06	---	3.E-07	4.E-06	Vinyl Chloride	liver	4.E+00	---	3.E-01	4.E+00
			Tetrachloroethene	1.E-05	---	4.E-05	5.E-05	C11-C22 Aromatics	decreased body weight	2.E-01	---	2.E+00	2.E+00
			Trichloroethene	9.E-05	---	2.E-04	3.E-04	Arsenic	skin, circulatory	3.E+00	---	2.E-02	3.E+00
			Vinyl Chloride	2.E-02	---	1.E-03	2.E-02	Chromium VI (aerosols)	no observed effect	6.E-01	---	1.E+00	2.E+00
			Aldrin	8.E-06	---	1.E-07	8.E-06	Manganese	central nervous	7.E+00	---	1.E+00	9.E+00
			alpha-BHC	2.E-06	---	3.E-06	4.E-06	(Total)		3.E+01	---	2.E+01	5.E+01
			gamma-BHC (Lindane)	9.E-07	---	2.E-06	3.E-06						
			Dieldrin	7.E-06	---	1.E-06	8.E-06						
			Heptachlor	2.E-06	---	2.E-07	2.E-06						
			Heptachlor Epoxide	2.E-06	---	2.E-07	2.E-06						
			Arsenic	4.E-04	---	4.E-06	4.E-04						
			(Total)	2.E-02	---	1.E-03	2.E-02						

Total Risk Across Soil	2.E-04
Total Risk Across Groundwater	2.E-02
(2) Total Risk Across All Media and Direct Exposure Routes	2.E-02
(3) Total Risk Across All Media and All Exposure Routes	4.E-02

(4) Total Hazard Index Across All Media and Direct Exposure Routes	6.E+01
(5) Total Hazard Index Across All Media and All Exposure Routes	8.E+01

(6) Total Hazard Index Divided by Target Organ

$HI_{hematologic}$	2.E+01	HI_{immune}	6.E+00
$HI_{reproductive}$	NA	$HI_{gastrointestinal}$	NA
$HI_{central\ nervous}$	1.E+01	HI_{skin}	7.E+00
HI_{kidney}	7.E+00	HI_{liver}	2.E+01
$HI_{circulatory}$	7.E+00		

(1) Risk from soil dust and vapor inhalation is based on modeled EPCs (see equations and text in section 3.3.6) and calculations of dose as shown in sections 3.4.6 and 3.4.7 of the Baseline Risk Assessment report.

Following USEPA Guidance, we assume that the hazard and risk from indoor inhalation of VOCs in groundwater are equal to the hazard and risk estimated for ingestion of VOCs in groundwater (USEPA Region 1 Risk Update, 1995).

(2) The "Total Risk Across All Media and Direct Exposure Routes" is the risk from the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.

(3) The "Total Risk Across All Media and All Exposure Routes" is the risk from the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.

(4) The "Total Hazard Index Across All Media and Direct Exposure Routes" is the HI for the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.

(5) The "Total Hazard Index Across All Media and All Exposure Routes" is the HI for the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.

(6) The "Total Hazard Index Across All Media and Direct Exposure Routes" is divided based on the primary target organ for each COC (see Table 16 of the Baseline Risk Assessment report).

Each COC may affect more than one target organ, thus the sum of the hazard indices by target organ does not equal the total hazard index.

NA = Not applicable because this is not a primary target organ for any risk driver COCs on this table.

TABLE 10.1.CT

RISK ASSESSMENT SUMMARY

CENTRAL TENDENCY

Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation (1)	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation (1)	Dermal	Exposure Routes Total
Soil	Surface and subsurface soil	0 to 10 foot soil	Polychlorinated Biphenyls	3.E-06	---	4.E-07	3.E-06	Polychlorinated Biphenyls	immune	2.E+00	---	2.E-01	2.E+00
			PCB-105	1.E-06	---	2.E-07	1.E-06	(Total)		2.E+00	---	3.E-01	2.E+00
			PCB-118	2.E-06	---	2.E-07	2.E-06						
			PCB-126	4.E-06	---	6.E-07	4.E-06						
			(Total)	1.E-05	---	2.E-06	1.E-05						
Groundwater	Groundwater	Tapwater	1,1-Dichloroethene	2.E-06	---	1.E-07	2.E-06	Manganese	central nervous	2.E+00	---	1.E-01	2.E+00
			Vinyl Chloride	8.E-05	---	3.E-06	8.E-05						
			Arsenic	3.E-05	---	1.E-07	3.E-05						
			(Total)	1.E-04	---	4.E-06	1.E-04	(Total)		3.E+00	---	6.E-01	4.E+00

Total Risk Across Soil	1E-05
Total Risk Across Groundwater	1E-04
(2) Total Risk Across All Media and Direct Exposure Routes	1E-04
(3) Total Risk Across All Media and All Exposure Routes	2.E-04

(4) Total Hazard Index Across All Media and Direct Exposure Routes	6.E+00
(5) Total Hazard Index Across All Media and All Exposure Routes	7.E+00

(6) Total Hazard Index Divided by Target Organ

$HI_{hematologic}$	NA	HI_{immune}	2.E+00
$HI_{reproductive}$	NA	$HI_{gastrointestinal}$	NA
$HI_{central\ nervous}$	2.E+00	HI_{skin}	NA
HI_{kidney}	NA	HI_{liver}	NA
$HI_{circulatory}$	NA		

(1) Risk from soil dust and vapor inhalation is based on modeled EPCs (see equations and text in section 3.3.6) and calculations of dose as shown in sections 3.4.6 and 3.4.7 of the Baseline Risk Assessment report.

Following USEPA Guidance, we assume that the hazard and risk from indoor inhalation of VOCs in groundwater are equal to the hazard and risk estimated for ingestion of VOCs in groundwater (USEPA Region 1 Risk Update, 1995).

(2) The "Total Risk Across All Media and Direct Exposure Routes" is the risk from the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.

(3) The "Total Risk Across All Media and All Exposure Routes" is the risk from the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.

(4) The "Total Hazard Index Across All Media and Direct Exposure Routes" is the HI for the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.

(5) The "Total Hazard Index Across All Media and All Exposure Routes" is the HI for the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.

(6) The "Total Hazard Index Across All Media and Direct Exposure Routes" is divided based on the primary target organ for each COC (see Table 16 of the Baseline Risk Assessment report).

Each COC may affect more than one target organ, thus the sum of the hazard indices by target organ does not equal the total hazard index.

NA = Not applicable because this is not a primary target organ for any risk driver COCs on this table.

TABLE 10.2.RME

RISK ASSESSMENT SUMMARY

REASONABLE MAXIMUM EXPOSURE

Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation (1)	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation (1)	Dermal	Exposure Routes Total
Soil	Surface and subsurface soil	0 to 10 foot soil	Benzo(a)pyrene	7.E-06	---	3.E-06	1.E-05	Polychlorinated Biphenyls	immune	3.E+01	---	1.E+01	4.E+01
			Dibenz(ah)anthracene	8.E-07	---	3.E-07	1.E-06	Chromium VI (particulates)	no observed effect	1.E+00	---	3.E+00	4.E+00
			Polychlorinated Biphenyls	8.E-05	---	3.E-05	1.E-04	Mercury	central nervous	1.E+00	---	6.E-01	2.E+00
			PCB-77	2.E-05	---	9.E-06	3.E-05	Nickel	decreased body and organ weights	3.E-01	---	8.E-01	1.E+00
			PCB-105	2.E-05	---	7.E-06	2.E-05	(Total)		3.E+01	---	2.E+01	5.E+01
			PCB-114	5.E-06	---	2.E-06	7.E-06						
			PCB-118	2.E-05	---	1.E-05	3.E-05						
			PCB-123	1.E-06	---	5.E-07	2.E-06						
			PCB-126	6.E-05	---	2.E-05	8.E-05						
			PCB-156	2.E-06	---	8.E-07	3.E-06						
			2,3,4,7,8-PeCDF	5.E-06	---	5.E-07	6.E-06						
			Arsenic	5.E-06	---	5.E-07	5.E-06						
			(Total)	2.E-04	---	9.E-05	3.E-04						
Groundwater	Groundwater	Tapwater	Benzene	6.E-05	---	3.E-05	9.E-05	Benzene	hematologic	2.E+01	---	1.E+01	3.E+01
			1,2-Dichloroethane	1.E-05	---	3.E-07	1.E-05	1,1-Dichloroethane	no observed effect	1.E+00	---	4.E-02	1.E+00
			1,1-Dichloroethene	6.E-05	---	4.E-06	6.E-05	1,2-Dichloroethene (cis)	liver	2.E+01	---	1.E+00	3.E+01
			Methylene Chloride	1.E-04	---	2.E-06	1.E-04	Ethylbenzene	liver, kidney	9.E-01	---	4.E+00	5.E+00
			1,1,2,2-Tetrachloroethane	3.E-06	---	1.E-07	3.E-06	Methylene Chloride	liver	3.E+00	---	6.E-02	3.E+00
			Tetrachloroethene	1.E-05	---	2.E-05	3.E-05	Toluene	liver, kidney	3.E-01	---	1.E+00	1.E+00
			Trichloroethene	8.E-05	---	8.E-05	2.E-04	1,1,1-Trichloroethane	central nervous	3.E+00	---	2.E-01	3.E+00
			Vinyl Chloride	2.E-02	---	5.E-04	2.E-02	Vinyl Chloride	liver	1.E+01	---	5.E-01	1.E+01
			Aldrin	7.E-06	---	5.E-08	7.E-06	C9-C10 Aromatics	decreased body weight	2.E+00	---	6.E-01	2.E+00
			alpha-BHC	1.E-06	---	1.E-06	3.E-06	C11-C22 Aromatics	decreased body weight	7.E-01	---	4.E+00	5.E+00
			gamma-BHC (Lindane)	8.E-07	---	8.E-07	2.E-06	Naphthalene	decreased body weight	1.E+00	---	3.E-01	1.E+00
			Dieldrin	6.E-06	---	5.E-07	7.E-06	Antimony	longevity, blood glucose, cholesterol	2.E+00	---	8.E-02	2.E+00
			Heptachlor	2.E-06	---	8.E-08	2.E-06	Arsenic	skin, circulatory	9.E+00	---	4.E-02	9.E+00
			Heptachlor Epoxide	1.E-06	---	8.E-08	2.E-06	Cadmium (Water)	kidney	2.E+00	---	1.E-01	2.E+00
			Arsenic	3.E-04	---	2.E-06	3.E-04	Chromium VI (aerosols)	no observed effect	2.E+00	---	2.E+00	4.E+00
			(Total)	2.E-02	---	6.E-04	2.E-02	Manganese	central nervous	3.E+01	---	2.E+00	3.E+01
								(Total)		1.E+02	---	3.E+01	1.E+02

Total Risk Across Soil	3.E-04
Total Risk Across Groundwater	2.E-02
(2) Total Risk Across All Media and Direct Exposure Routes	2.E-02
(3) Total Risk Across All Media and All Exposure Routes	3.E-02

(4) Total Hazard Index Across All Media and Direct Exposure Routes	2.E+02
(5) Total Hazard Index Across All Media and All Exposure Routes	3.E+02

(6) Total Hazard Index Divided by Target Organ

$HI_{hematologic}$	5.E+01	HI_{immune}	6.E+01
$HI_{reproductive}$	NA	$HI_{gastrointestinal}$	NA
$HI_{central\ nervous}$	5.E+01	HI_{skin}	3.E+01
HI_{kidney}	3.E+01	HI_{liver}	7.E+01
$HI_{circulatory}$	3.E+01		

(1) Risk from soil dust and vapor inhalation is based on modeled EPCs (see equations and text in section 3.3.6) and calculations of dose as shown in sections 3.4.6 and 3.4.7 of the Baseline Risk Assessment report.

Following USEPA Guidance, we assume that the hazard and risk from indoor inhalation of VOCs in groundwater are equal to the hazard and risk estimated for ingestion of VOCs in groundwater (USEPA Region 1 Risk Update, 1995).

(2) The "Total Risk Across All Media and Direct Exposure Routes" is the risk from the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation (1)	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation (1)	Dermal	Exposure Routes Total

(3) The "Total Risk Across All Media and All Exposure Routes" is the risk from the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.

(4) The "Total Hazard Index Across All Media and Direct Exposure Routes" is the HI for the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.

(5) The "Total Hazard Index Across All Media and All Exposure Routes" is the HI for the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.

(6) The "Total Hazard Index Across All Media and Direct Exposure Routes" is divided based on the primary target organ for each COC (see Table 16 of the Baseline Risk Assessment report).

Each COC may affect more than one target organ, thus the sum of the hazard indices by target organ does not equal the total hazard index.

NA = Not applicable because this is not a primary target organ for any risk driver COCs on this table.

TABLE 10.2.CT

RISK ASSESSMENT SUMMARY

CENTRAL TENDENCY

Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation (1)	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation (1)	Dermal	Exposure Routes Total
Soil	Surface and subsurface soil	0 to 10 foot soil	Polychlorinated Biphenyls	7.E-06	---	2.E-06	8.E-06	Polychlorinated Biphenyls	immune	1.E+01	---	3.E+00	2.E+01
			PCB-105	3.E-06	---	7.E-07	3.E-06	(Total)		1.E+01	---	4.E+00	2.E+01
			PCB-114	9.E-07	---	2.E-07	1.E-06						
			PCB-118	4.E-06	---	1.E-06	5.E-06						
			PCB-126	1.E-05	---	2.E-06	1.E-05						
			(Total)	3.E-05	---	6.E-06	3.E-05						
Groundwater	Groundwater	Tapwater	1,1-Dichloroethene	2.E-06	---	7.E-08	2.E-06	Arsenic	skin, circulatory	2.E+00	---	6.E-03	2.E+00
			Vinyl Chloride	7.E-05	---	1.E-06	7.E-05	Manganese	central nervous	5.E+00	---	3.E-01	5.E+00
			Arsenic	3.E-05	---	7.E-08	3.E-05	(Total)		1.E+01	---	1.E+00	1.E+01
			(Total)	1.E-04	---	2.E-06	1.E-04						

Total Risk Across Soil	3E-05
Total Risk Across Groundwater	1E-04
(2) Total Risk Across All Media and Direct Exposure Routes	1E-04
(3) Total Risk Across All Media and All Exposure Routes	2.E-04

(4) Total Hazard Index Across All Media and Direct Exposure Routes	3.E+01
(5) Total Hazard Index Across All Media and All Exposure Routes	3.E+01

(6) Total Hazard Index Divided by Target Organ

$HI_{hematologic}$	NA	HI_{immune}	2.E+01
$HI_{reproductive}$	NA	$HI_{gastrointestinal}$	NA
$HI_{central\ nervous}$	5.E+00	HI_{skin}	2.E+00
HI_{kidney}	NA	HI_{liver}	NA
$HI_{circulatory}$	2.E+00		

(1) Risk from soil dust and vapor inhalation is based on modeled EPCs (see equations and text in section 3.3.6) and calculations of dose as shown in sections 3.4.6 and 3.4.7 of the Baseline Risk Assessment report.

Following USEPA Guidance, we assume that the hazard and risk from indoor inhalation of VOCs in groundwater are equal to the hazard and risk estimated for ingestion of VOCs in groundwater (USEPA Region 1 Risk Update, 1995).

(2) The "Total Risk Across All Media and Direct Exposure Routes" is the risk from the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.

(3) The "Total Risk Across All Media and All Exposure Routes" is the risk from the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.

(4) The "Total Hazard Index Across All Media and Direct Exposure Routes" is the HI for the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.

(5) The "Total Hazard Index Across All Media and All Exposure Routes" is the HI for the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.

(6) The "Total Hazard Index Across All Media and Direct Exposure Routes" is divided based on the primary target organ for each COC (see Table 16 of the Baseline Risk Assessment report).

Each COC may affect more than one target organ, thus the sum of the hazard indices by target organ does not equal the total hazard index.

NA = Not applicable because this is not a primary target organ for any risk driver COCs on this table.

TABLE 10.3.RME
RISK ASSESSMENT SUMMARY
REASONABLE MAXIMUM EXPOSURE
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation (1)	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation (1)	Dermal	Exposure Routes Total
Soil	Surface soil	0 to 1 foot soil	Benzo(a)pyrene	3.E-06	---	2.E-06	5.E-06	Polychlorinated Biphenyls	immune	1.E+01	---	7.E+00	2.E+01
			Polychlorinated Biphenyls	2.E-04	---	9.E-05	2.E-04	(Total)		1.E+01	---	7.E+00	2.E+01
			PCB-77	1.E-05	---	5.E-06	2.E-05						
			PCB-105	1.E-05	---	8.E-06	2.E-05						
			PCB-114	7.E-06	---	4.E-06	1.E-05						
			PCB-118	2.E-05	---	1.E-05	4.E-05						
			PCB-123	2.E-06	---	1.E-06	4.E-06						
			PCB-126	9.E-05	---	5.E-05	1.E-04						
			PCB-156	4.E-06	---	2.E-06	6.E-06						
			PCB-157	9.E-07	---	5.E-07	1.E-06						
			2,3,4,7,8-PeCDF	2.E-06	---	3.E-07	3.E-06						
			Arsenic	2.E-06	---	3.E-07	3.E-06						
			(Total)	3.E-04	---	2.E-04	5.E-04						
Groundwater	Groundwater	Tapwater	Benzene	7.E-05	---	7.E-05	1.E-04	Benzene	hematologic	7.E+00	---	7.E+00	1.E+01
			1,2-Dichloroethane	2.E-05	---	7.E-07	2.E-05	1,2-Dichloroethene (cis)	liver	7.E+00	---	6.E-01	7.E+00
			1,1-Dichloroethene	7.E-05	---	1.E-05	8.E-05	Ethylbenzene	liver, kidney	3.E-01	---	2.E+00	3.E+00
			Methylene Chloride	1.E-04	---	5.E-06	1.E-04	1,1,1-Trichloroethane	central nervous	9.E-01	---	1.E-01	1.E+00
			1,1,2,2-Tetrachloroethane	4.E-06	---	3.E-07	4.E-06	Vinyl Chloride	liver	4.E+00	---	3.E-01	4.E+00
			Tetrachloroethene	1.E-05	---	4.E-05	5.E-05	C11-C22 Aromatics	decreased body weight	2.E-01	---	2.E+00	2.E+00
			Trichloroethene	9.E-05	---	2.E-04	3.E-04	Arsenic	skin, circulatory	3.E+00	---	2.E-02	3.E+00
			Vinyl Chloride	2.E-02	---	1.E-03	2.E-02	Chromium VI (aerosols)	no observed effect	6.E-01	---	1.E+00	2.E+00
			Aldrin	8.E-06	---	1.E-07	8.E-06	Manganese	central nervous	7.E+00	---	1.E+00	9.E+00
			alpha-BHC	2.E-06	---	3.E-06	4.E-06	(Total)		3.E+01	---	2.E+01	5.E+01
			gamma-BHC (Lindane)	9.E-07	---	2.E-06	3.E-06						
			Dieldrin	7.E-06	---	1.E-06	8.E-06						
			Heptachlor	2.E-06	---	2.E-07	2.E-06						
			Heptachlor Epoxide	2.E-06	---	2.E-07	2.E-06						
			Arsenic	4.E-04	---	4.E-06	4.E-04						
			(Total)	2.E-02	---	1.E-03	2.E-02						

Total Risk Across Soil	5E-04
Total Risk Across Groundwater	2E-02
(2) Total Risk Across All Media and Direct Exposure Routes	2E-02
(3) Total Risk Across All Media and All Exposure Routes	4.E-02

(4) Total Hazard Index Across All Media and Direct Exposure Routes	7.E+01
(5) Total Hazard Index Across All Media and All Exposure Routes	9.E+01

(6) Total Hazard Index Divided by Target Organ

$HI_{hematologic}$	2.E+01	HI_{immune}	2.E+01
$HI_{reproductive}$	NA	$HI_{gastrointestinal}$	NA
$HI_{central\ nervous}$	1.E+01	HI_{skin}	7.E+00
HI_{kidney}	7.E+00	HI_{liver}	2.E+01
$HI_{circulatory}$	7.E+00		

(1) Risk from soil dust and vapor inhalation is based on modeled EPCs (see equations and text in section 3.3.6) and calculations of dose as shown in sections 3.4.6 and 3.4.7 of the Baseline Risk Assessment report.
Following USEPA Guidance, we assume that the hazard and risk from indoor inhalation of VOCs in groundwater are equal to the hazard and risk estimated for ingestion of VOCs in groundwater (USEPA Region 1 Risk Update, 1995).
(2) The "Total Risk Across All Media and Direct Exposure Routes" is the risk from the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.
(3) The "Total Risk Across All Media and All Exposure Routes" is the risk from the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.
(4) The "Total Hazard Index Across All Media and Direct Exposure Routes" is the HI for the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.
(5) The "Total Hazard Index Across All Media and All Exposure Routes" is the HI for the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.
(6) The "Total Hazard Index Across All Media and Direct Exposure Routes" is divided based on the primary target organ for each COC (see Table 16 of the Baseline Risk Assessment report).
Each COC may affect more than one target organ, thus the sum of the hazard indices by target organ does not equal the total hazard index.
NA = Not applicable because this is not a primary target organ for any risk driver COCs on this table.

TABLE 10.3.CT

RISK ASSESSMENT SUMMARY

CENTRAL TENDENCY

Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation (1)	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation (1)	Dermal	Exposure Routes Total
Soil	Surface soil	0 to 1 foot soil	Polychlorinated Biphenyls	1.E-05	---	2.E-06	1.E-05	Polychlorinated Biphenyls	immune	6.E+00	---	9.E-01	7.E+00
			PCB-126	4.E-06	---	6.E-07	4.E-06	(Total)		6.E+00	---	1.E+00	7.E+00
			(Total)	2.E-05	---	3.E-06	2.E-05						
Groundwater	Groundwater	Tapwater	1,1-Dichloroethene	2.E-06	---	1.E-07	2.E-06	Manganese	central nervous	2.E+00	---	1.E-01	2.E+00
			Vinyl Chloride	8.E-05	---	3.E-06	8.E-05						
			Arsenic	3.E-05	---	1.E-07	3.E-05						
			(Total)	1.E-04	---	4.E-06	1.E-04	(Total)		3.E+00	---	6.E-01	4.E+00

Total Risk Across Soil	2E-05
Total Risk Across Groundwater	1E-04
(2) Total Risk Across All Media and Direct Exposure Routes	1E-04
(3) Total Risk Across All Media and All Exposure Routes	2.E-04

(4) Total Hazard Index Across All Media and Direct Exposure Routes	1.E+01
(5) Total Hazard Index Across All Media and All Exposure Routes	1.E+01

(6) Total Hazard Index Divided by Target Organ

$HI_{hematologic}$	NA	HI_{immune}	7.E+00
$HI_{reproductive}$	NA	$HI_{gastrointestinal}$	NA
$HI_{central\ nervous}$	2.E+00	HI_{skin}	NA
HI_{kidney}	NA	HI_{liver}	NA
$HI_{circulatory}$	NA		

(1) Risk from soil dust and vapor inhalation is based on modeled EPCs (see equations and text in section 3.3.6) and calculations of dose as shown in sections 3.4.6 and 3.4.7 of the Baseline Risk Assessment report.

Following USEPA Guidance, we assume that the hazard and risk from indoor inhalation of VOCs in groundwater are equal to the hazard and risk estimated for ingestion of VOCs in groundwater (USEPA Region 1 Risk Update, 1995).

(2) The "Total Risk Across All Media and Direct Exposure Routes" is the risk from the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.

(3) The "Total Risk Across All Media and All Exposure Routes" is the risk from the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.

(4) The "Total Hazard Index Across All Media and Direct Exposure Routes" is the HI for the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.

(5) The "Total Hazard Index Across All Media and All Exposure Routes" is the HI for the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.

(6) The "Total Hazard Index Across All Media and Direct Exposure Routes" is divided based on the primary target organ for each COC (see Table 16 of the Baseline Risk Assessment report).

Each COC may affect more than one target organ, thus the sum of the hazard indices by target organ does not equal the total hazard index.

NA = Not applicable because this is not a primary target organ for any risk driver COCs on this table.

TABLE 10.4.RME
RISK ASSESSMENT SUMMARY
REASONABLE MAXIMUM EXPOSURE
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation (1)	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation (1)	Dermal	Exposure Routes Total
Soil	Surface soil	0 to 1 foot soil	Benz(a)anthracene	1.E-06	---	5.E-07	2.E-06	C11-C22 Aromatics	decreased body weight	2E+00	---	8E-01	2.E+00
			Benzo(a)pyrene	7.E-06	---	3.E-06	1.E-05	Polychlorinated Biphenyls	immune	1.E+02	---	5.E+01	2.E+02
			Dibenz(ah)anthracene	1.E-06	---	4.E-07	1.E-06	Chromium VI (particulates)	no observed effect	1.E+00	---	3.E+00	4.E+00
			bis(2-Ethylhexyl)phthalate	9.E-07	---	3.E-07	1.E-06	Nickel	decreased body and organ weights	3.E-01	---	8.E-01	1.E+00
			Polychlorinated Biphenyls	4.E-04	---	2.E-04	5.E-04	(Total)		1.E+02	---	5.E+01	2.E+02
			PCB-77	2.E-05	---	9.E-06	3.E-05						
			PCB-81	7.E-07	---	3.E-07	1.E-06						
			PCB-105	3.E-05	---	1.E-05	5.E-05						
			PCB-114	2.E-05	---	7.E-06	2.E-05						
			PCB-118	5.E-05	---	2.E-05	8.E-05						
			PCB-123	6.E-06	---	2.E-06	8.E-06						
			PCB-126	2.E-04	---	9.E-05	3.E-04						
			PCB-156	8.E-06	---	3.E-06	1.E-05						
			PCB-157	2.E-06	---	8.E-07	3.E-06						
			2,3,4,7,8-PeCDF	5.E-06	---	5.E-07	6.E-06						
			Arsenic	5.E-06	---	5.E-07	6.E-06						
			(Total)	7.E-04	---	3.E-04	1.E-03						
Groundwater	Groundwater	Tapwater	Benzene	6.E-05	---	3.E-05	9.E-05	Benzene	hematologic	2.E+01	---	1.E+01	3.E+01
			1,2-Dichloroethane	1.E-05	---	3.E-07	1.E-05	1,1-Dichloroethane	no observed effect	1.E+00	---	4.E-02	1.E+00
			1,1-Dichloroethene	6.E-05	---	4.E-06	6.E-05	1,2-Dichloroethene (cis)	liver	2.E+01	---	1.E+00	3.E+01
			Methylene Chloride	1.E-04	---	2.E-06	1.E-04	Ethylbenzene	liver, kidney	9.E-01	---	4.E+00	5.E+00
			1,1,2,2-Tetrachloroethane	3.E-06	---	1.E-07	3.E-06	Methylene Chloride	liver	3.E+00	---	6.E-02	3.E+00
			Tetrachloroethene	1.E-05	---	2.E-05	3.E-05	Toluene	liver, kidney	3.E-01	---	1.E+00	1.E+00
			Trichloroethene	8.E-05	---	8.E-05	2.E-04	1,1,1-Trichloroethane	central nervous	3.E+00	---	2.E-01	3.E+00
			Vinyl Chloride	2.E-02	---	5.E-04	2.E-02	Vinyl Chloride	liver	1.E+01	---	5.E-01	1.E+01
			Aldrin	7.E-06	---	5.E-08	7.E-06	C9-C10 Aromatics	decreased body weight	2.E+00	---	6.E-01	2.E+00
			alpha-BHC	1.E-06	---	1.E-06	3.E-06	C11-C22 Aromatics	decreased body weight	7.E-01	---	4.E+00	5.E+00
			gamma-BHC (Lindane)	8.E-07	---	8.E-07	2.E-06	Naphthalene	decreased body weight	1.E+00	---	3.E-01	1.E+00
			Dieldrin	6.E-06	---	5.E-07	7.E-06	Antimony	longevity, blood glucose, cholesterol	2.E+00	---	8.E-02	2.E+00
			Heptachlor	2.E-06	---	8.E-08	2.E-06	Arsenic	skin, circulatory	9.E+00	---	4.E-02	9.E+00
			Heptachlor Epoxide	1.E-06	---	8.E-08	2.E-06	Cadmium (Water)	kidney	2.E+00	---	1.E-01	2.E+00
			Arsenic	3.E-04	---	2.E-06	3.E-04	Chromium VI (aerosols)	no observed effect	2.E+00	---	2.E+00	4.E+00
			(Total)	2.E-02	---	6.E-04	2.E-02	Manganese	central nervous	3.E+01	---	2.E+00	3.E+01
								(Total)		1.E+02	---	3.E+01	1.E+02

Total Risk Across Soil	1E-03
Total Risk Across Groundwater	2E-02
(2) Total Risk Across All Media and Direct Exposure Routes	2E-02
(3) Total Risk Across All Media and All Exposure Routes	3.E-02
(4) Total Hazard Index Across All Media and Direct Exposure Routes	3.E+02
(5) Total Hazard Index Across All Media and All Exposure Routes	4.E+02

(6) Total Hazard Index Divided by Target Organ

$HI_{hematologic}$	6.E+01	HI_{immune}	2.E+02
$HI_{reproductive}$	NA	$HI_{gastrointestinal}$	NA
$HI_{central\ nervous}$	5.E+01	HI_{skin}	3.E+01
HI_{kidney}	3.E+01	HI_{liver}	7.E+01
$HI_{circulatory}$	3.E+01		

(1) Risk from soil dust and vapor inhalation is based on modeled EPCs (see equations and text in section 3.3.6) and calculations of dose as shown in sections 3.4.6 and 3.4.7 of the Baseline Risk Assessment report.
Following USEPA Guidance, we assume that the hazard and risk from indoor inhalation of VOCs in groundwater are equal to the hazard and risk estimated for ingestion of VOCs in groundwater (USEPA Region 1 Risk Update, 1995).
(2) The "Total Risk Across All Media and Direct Exposure Routes" is the risk from the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.
(3) The "Total Risk Across All Media and All Exposure Routes" is the risk from the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.
(4) The "Total Hazard Index Across All Media and Direct Exposure Routes" is the HI for the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.
(5) The "Total Hazard Index Across All Media and All Exposure Routes" is the HI for the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.
(6) The "Total Hazard Index Across All Media and Direct Exposure Routes" is divided based on the primary target organ for each COC (see Table 16 of the Baseline Risk Assessment report).
Each COC may affect more than one target organ, thus the sum of the hazard indices by target organ does not equal the total hazard index.
NA = Not applicable because this is not a primary target organ for any risk driver COCs on this table.

TABLE 10.4.CT

RISK ASSESSMENT SUMMARY

CENTRAL TENDENCY

Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation (1)	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation (1)	Dermal	Exposure Routes Total
Soil	Surface soil	0 to 1 foot soil	Polychlorinated Biphenyls	3.E-05	---	8.E-06	4.E-05	Polychlorinated Biphenyls	immune	6.E+01	---	1.E+01	7.E+01
			PCB-77	9.E-07	---	2.E-07	1.E-06	(Total)		6.E+01	---	1.E+01	7.E+01
			PCB-105	1.E-06	---	3.E-07	2.E-06						
			PCB-118	2.E-06	---	5.E-07	3.E-06						
			PCB-126	1.E-05	---	2.E-06	1.E-05						
			(Total)	5.E-05	---	1.E-05	6.E-05						
Groundwater	Groundwater	Tapwater	1,1-Dichloroethene	2.E-06	---	7.E-08	2.E-06	Arsenic	skin, circulatory	2.E+00	---	6.E-03	2.E+00
			Vinyl Chloride	7.E-05	---	1.E-06	7.E-05	Manganese	central nervous	5.E+00	---	3.E-01	5.E+00
			Arsenic	3.E-05	---	7.E-08	3.E-05	(Total)		1.E+01	---	1.E+00	1.E+01
			(Total)	1.E-04	---	2.E-06	1.E-04						

Total Risk Across Soil	6E-05
Total Risk Across Groundwater	1E-04
(2) Total Risk Across All Media and Direct Exposure Routes	2E-04
(3) Total Risk Across All Media and All Exposure Routes	2.E-04

(4) Total Hazard Index Across All Media and Direct Exposure Routes	8.E+01
(5) Total Hazard Index Across All Media and All Exposure Routes	8.E+01

(6) Total Hazard Index Divided by Target Organ

$HI_{hematologic}$	NA	HI_{immune}	7.E+01
$HI_{reproductive}$	NA	$HI_{gastrointestinal}$	NA
$HI_{central\ nervous}$	5.E+00	HI_{skin}	2.E+00
HI_{kidney}	NA	HI_{liver}	NA
$HI_{circulatory}$	2.E+00		

(1) Risk from soil dust and vapor inhalation is based on modeled EPCs (see equations and text in section 3.3.6) and calculations of dose as shown in sections 3.4.6 and 3.4.7 of the Baseline Risk Assessment report.

Following USEPA Guidance, we assume that the hazard and risk from indoor inhalation of VOCs in groundwater are equal to the hazard and risk estimated for ingestion of VOCs in groundwater (USEPA Region 1 Risk Update, 1995).

(2) The "Total Risk Across All Media and Direct Exposure Routes" is the risk from the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.

(3) The "Total Risk Across All Media and All Exposure Routes" is the risk from the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.

(4) The "Total Hazard Index Across All Media and Direct Exposure Routes" is the HI for the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.

(5) The "Total Hazard Index Across All Media and All Exposure Routes" is the HI for the direct exposure pathways, plus soil dust and vapor inhalation and groundwater vapor inhalation pathways.

(6) The "Total Hazard Index Across All Media and Direct Exposure Routes" is divided based on the primary target organ for each COC (see Table 16 of the Baseline Risk Assessment report).

Each COC may affect more than one target organ, thus the sum of the hazard indices by target organ does not equal the total hazard index.

NA = Not applicable because this is not a primary target organ for any risk driver COCs on this table.

TABLE 10.5.RME

RISK ASSESSMENT SUMMARY

REASONABLE MAXIMUM EXPOSURE

Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation (1)	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation (1)	Dermal	Exposure Routes Total
Groundwater	Groundwater	Tapwater	1,2-Dichloroethane	9.E-07	---	5.E-08	1.E-06						
			Trichloroethene	4.E-07	---	9.E-07	1.E-06						
			Vinyl Chloride	5.E-05	---	3.E-06	5.E-05						
			(Total)	5.E-05	---	4.E-06	6.E-05	(Total)		1.E-01	---	2.E-02	1.E-01

Total Risk Across Groundwater	6E-05
(2) Total Risk Across All Media and Direct Exposure Routes	6E-05
(3) Total Risk Across All Media and All Exposure Routes	1.E-04

(4) Total Hazard Index Across All Media and Direct Exposure Routes	1.E-01
(5) Total Hazard Index Across All Media and All Exposure Routes	2.E-01

(1) Following USEPA Guidance, we assume that the hazard and risk from indoor inhalation of VOCs in groundwater are equal to the hazard and risk estimated for ingestion of VOCs in groundwater (USEPA Region 1 Risk Update, 1995).

(2) The "Total Risk Across All Media and Direct Exposure Routes" is the risk from the groundwater ingestion and groundwater dermal contact exposure pathways.

(3) The "Total Risk Across All Media and All Exposure Routes" is the risk from the direct exposure pathways plus the groundwater vapor inhalation pathway.

(4) The "Total Hazard Index Across All Media and Direct Exposure Routes" is the HI for the groundwater ingestion and groundwater dermal contact exposure pathways.

(5) The "Total Hazard Index Across All Media and All Exposure Routes" is the HI for the direct exposure pathways plus the groundwater vapor inhalation pathway.

TABLE 10.5.CT

RISK ASSESSMENT SUMMARY

CENTRAL TENDENCY

Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation (1)	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation (1)	Dermal	Exposure Routes Total
Groundwater	Groundwater	Tapwater	Vinyl Chloride	6.E-06	---	2.E-07	6.E-06						
			(Total)	6.E-06	---	2.E-07	6.E-06	(Total)		5.E-02	---	5.E-03	6.E-02

Total Risk Across Groundwater	6E-06
(2) Total Risk Across All Media and Direct Exposure Routes	6E-06
(3) Total Risk Across All Media and All Exposure Routes	1.E-05

(4) Total Hazard Index Across All Media and Direct Exposure Routes	6.E-02
(5) Total Hazard Index Across All Media and All Exposure Routes	1.E-01

(1) Following USEPA Guidance, we assume that the hazard and risk from indoor inhalation of VOCs in groundwater are equal to the hazard and risk estimated for ingestion of VOCs in groundwater (USEPA Region 1 Risk Update, 1995).

(2) The "Total Risk Across All Media and Direct Exposure Routes" is the risk from the groundwater ingestion and groundwater dermal contact exposure pathways.

(3) The "Total Risk Across All Media and All Exposure Routes" is the risk from the direct exposure pathways plus the groundwater vapor inhalation pathway.

(4) The "Total Hazard Index Across All Media and Direct Exposure Routes" is the HI for the groundwater ingestion and groundwater dermal contact exposure pathways.

(5) The "Total Hazard Index Across All Media and All Exposure Routes" is the HI for the direct exposure pathways plus the groundwater vapor inhalation pathway.

TABLE 10.6.RME

RISK ASSESSMENT SUMMARY

REASONABLE MAXIMUM EXPOSURE

Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation (1)	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation (1)	Dermal	Exposure Routes Total
Groundwater	Groundwater	Tapwater	Vinyl Chloride	4.E-05	---	1.E-06	4.E-05						
			(Total)	4.E-05	---	2.E-06	5.E-05	(Total)		4.E-01	---	4.E-02	4.E-01

Total Risk Across Groundwater	5E-05
(2) Total Risk Across All Media and Direct Exposure Routes	5E-05
(3) Total Risk Across All Media and All Exposure Routes	9.E-05

(4) Total Hazard Index Across All Media and Direct Exposure Routes	4.E-01
(5) Total Hazard Index Across All Media and All Exposure Routes	8.E-01

(1) Following USEPA Guidance, we assume that the hazard and risk from indoor inhalation of VOCs in groundwater are equal to the hazard and risk estimated for ingestion of VOCs in groundwater (USEPA Region 1 Risk Update, 1995).

(2) The "Total Risk Across All Media and Direct Exposure Routes" is the risk from the groundwater ingestion and groundwater dermal contact exposure pathways.

(3) The "Total Risk Across All Media and All Exposure Routes" is the risk from the direct exposure pathways plus the groundwater vapor inhalation pathway.

(4) The "Total Hazard Index Across All Media and Direct Exposure Routes" is the HI for the groundwater ingestion and groundwater dermal contact exposure pathways.

(5) The "Total Hazard Index Across All Media and All Exposure Routes" is the HI for the direct exposure pathways plus the groundwater vapor inhalation pathway.

TABLE 10.6.CT

RISK ASSESSMENT SUMMARY

CENTRAL TENDENCY

Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation (1)	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation (1)	Dermal	Exposure Routes Total
Groundwater	Groundwater	Tapwater	Vinyl Chloride	5.E-06	---	9.E-08	5.E-06						
			(Total)	5.E-06	---	1.E-07	5.E-06	(Total)		1.E-01	---	9.E-03	2.E-01

Total Risk Across Groundwater	5E-06
(2) Total Risk Across All Media and Direct Exposure Routes	5E-06
(3) Total Risk Across All Media and All Exposure Routes	1.E-05

(4) Total Hazard Index Across All Media and Direct Exposure Routes	2.E-01
(5) Total Hazard Index Across All Media and All Exposure Routes	3.E-01

(1) Following USEPA Guidance, we assume that the hazard and risk from indoor inhalation of VOCs in groundwater are equal to the hazard and risk estimated for ingestion of VOCs in groundwater (USEPA Region 1 Risk Update, 1995).

(2) The "Total Risk Across All Media and Direct Exposure Routes" is the risk from the groundwater ingestion and groundwater dermal contact exposure pathways.

(3) The "Total Risk Across All Media and All Exposure Routes" is the risk from the direct exposure pathways plus the groundwater vapor inhalation pathway.

(4) The "Total Hazard Index Across All Media and Direct Exposure Routes" is the HI for the groundwater ingestion and groundwater dermal contact exposure pathways.

(5) The "Total Hazard Index Across All Media and All Exposure Routes" is the HI for the direct exposure pathways plus the groundwater vapor inhalation pathway.

TABLE 10.7.RME

RISK ASSESSMENT SUMMARY (1)

REASONABLE MAXIMUM EXPOSURE

Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current/Future
Receptor Population: Fisherperson
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Surface Water	Kelley Brook and adjacent wetlands	Vinyl Chloride	3.E-07	---	1.E-06	1.E-06						
			Benz(a)anthracene	1.E-08	---	4.E-06	4.E-06						
			Benzo(a)pyrene	1.E-07	---	7.E-05	7.E-05						
			Benzo(b)fluoranthene	1.E-08	---	6.E-06	6.E-06						
			Dibenz(ah)anthracene	2.E-08	---	2.E-05	2.E-05						
			Indeno(123-cd)pyrene	1.E-08	---	1.E-05	1.E-05						
			(Total)	8.E-07	---	1.E-04	1.E-04	(Total)		9.E-03	---	5.E-02	6.E-02
Sediment	Sediment	Kelley Brook and adjacent wetlands	Polychlorinated Biphenyls	6.E-07	---	3.E-06	3.E-06						
			PCB-126	2.E-07	---	9.E-07	1.E-06						
			Arsenic	7.E-06	---	7.E-06	1.E-05						
			(Total)	9.E-06	---	1.E-05	2.E-05	(Total)		2.E-01	---	6.E-01	8.E-01
Other (Fish Tissue)	Animal Tissue	Brook Trout	Polychlorinated Biphenyls	3.E-05	---	---	3.E-05	Polychlorinated Biphenyls	immune	2.E+00	---	---	2.E+00
			PCB-118	2.E-06	---	---	2.E-06	(Total)		4.E+00	---	---	4.E+00
			PCB-126	1.E-05	---	---	1.E-05						
			PCB-156	3.E-05	---	---	3.E-05						
			Arsenic	3.E-05	---	---	3.E-05						
			(Total)	1.E-04	---	---	1.E-04						

Total Risk Across Surface Water	1E-04
Total Risk Across Sediment	2E-05
Total Risk Across Fish Tissue	1E-04
(2) Total Risk Across All Media and All Exposure Routes	2E-04

(3) Total Hazard Index Across All Media and All Exposure Routes	4.E+00

(4) Total Hazard Index Divided by Target Organ

$HI_{hematologic}$	NA	HI_{immune}	2.E+00
$HI_{reproductive}$	NA	$HI_{gastrointestinal}$	NA
$HI_{central\ nervous}$	NA	HI_{skin}	NA
HI_{kidney}	NA	HI_{liver}	NA
$HI_{circulatory}$	NA		

(1) Sediment and surface water risk estimates apply only to the oil discharge area of Kelley Brook (sample locations OS-5 to OS-10).

(2) The "Total Risk Across All Media and All Exposure Routes" is the sum of the risk from the following exposure pathways: surface water ingestion and dermal contact, sediment ingestion and dermal contact, and fish ingestion.

(3) The "Total Hazard Index Across All Media and All Exposure Routes" is the HI for the following exposure pathways: surface water ingestion and dermal contact, sediment ingestion and dermal contact, and fish ingestion.

(4) The "Total Hazard Index Across All Media and Direct Exposure Routes" is divided based on the primary target organ for each COC (see Table 16 of the Baseline Risk Assessment report).

Each COC may affect more than one target organ, thus the sum of the hazard indices by target organ does not equal the total hazard index.

NA = Not applicable because this is not a primary target organ for any risk driver COCs on this table.

TABLE 10.7.CT
RISK ASSESSMENT SUMMARY (1)
CENTRAL TENDENCY
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current/Future
Receptor Population: Fisherperson
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Surface Water	Kelley Brook and adjacent wetlands	(Total)	3.E-08	---	9.E-07	1.E-06	(Total)		2.E-03	---	6.E-03	7.E-03
Sediment	Sediment	Kelley Brook and adjacent wetlands	Arsenic	4.E-07	---	7.E-07	1.E-06						
			(Total)	4.E-07	---	8.E-07	1.E-06	(Total)		1.E-02	---	9.E-02	1.E-01
Tissue)	Animal Tissue	Brook Trout	(Total)	2.E-06	---	---	2.E-06	(Total)		3.E-01	---	---	3.E-01

Total Risk Across Surface Water	1E-06
Total Risk Across Sediment	1E-06
Total Risk Across Fish Tissue	2E-06
(2) Total Risk Across All Media and All Exposure Routes	5E-06

(3) Total Hazard Index Across All Media and All Exposure Routes	4.E-01

(1) Sediment and surface water risk estimates apply only to the oil discharge area of Kelley Brook (sample locations OS-5 to OS-10).

(2) The "Total Risk Across All Media and All Exposure Routes" is the sum of the risk from the following exposure pathways: surface water ingestion and dermal contact, sediment ingestion and dermal contact, and fish ingestion.

(3) The "Total Hazard Index Across All Media and All Exposure Routes" is the HI for the following exposure pathways: surface water ingestion and dermal contact, sediment ingestion and dermal contact, and fish ingestion.

TABLE 10.8.RME

RISK ASSESSMENT SUMMARY (1)

REASONABLE MAXIMUM EXPOSURE

Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current/Future
Receptor Population: Other Recreational Person
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Surface Water	Kelley Brook and adjacent wetlands	Vinyl Chloride	4.E-07	---	2.E-06	2.E-06						
			Benz(a)anthracene	2.E-08	---	6.E-06	6.E-06						
			Benzo(a)pyrene	2.E-07	---	1.E-04	1.E-04						
			Benzo(b)fluoranthene	2.E-08	---	1.E-05	1.E-05						
			Dibenz(ah)anthracene	3.E-08	---	3.E-05	3.E-05						
			Indeno(123-cd)pyrene	2.E-08	---	2.E-05	2.E-05						
			(Total)	1.E-06	---	2.E-04	2.E-04	(Total)		2.E-02	---	2.E-01	2.E-01
Sediment	Sediment	Kelley Brook and adjacent wetlands	Polychlorinated Biphenyls	8.E-07	---	6.E-06	7.E-06	Polychlorinated Biphenyls	immune	1.E-01	---	8.E-01	1.E+00
			PCB-126	3.E-07	---	2.E-06	2.E-06	Manganese	central nervous	1.E-01	---	1.E+00	1.E+00
			Arsenic	1.E-05	---	2.E-05	3.E-05	(Total)		4.E-01	---	3.E+00	3.E+00
			(Total)	1.E-05	---	3.E-05	4.E-05						

Total Risk Across Surface Water	2E-04
Total Risk Across Sediment	4E-05
(2) Total Risk Across All Media and All Exposure Routes	2E-04

(3) Total Hazard Index Across All Media and All Exposure Routes	3.E+00

(4) Total Hazard Index Divided by Target Organ

$HI_{hematologic}$	NA	HI_{immune}	1.E+00
$HI_{reproductive}$	NA	$HI_{gastrointestinal}$	NA
$HI_{central\ nervous}$	1.E+00	HI_{skin}	NA
HI_{kidney}	NA	HI_{liver}	NA
$HI_{circulatory}$	NA		

(1) Sediment and surface water risk estimates apply only to the oil discharge area of Kelley Brook (sample locations OS-5 to OS-10).

(2) The "Total Risk Across All Media and All Exposure Routes" is the sum of the risk from surface water and sediment via ingestion and dermal contact.

(3) The "Total Hazard Index Across All Media and All Exposure Routes" is the HI for exposure to surface water and sediment via ingestion and dermal contact.

(4) The "Total Hazard Index Across All Media and Direct Exposure Routes" is divided based on the primary target organ for each COC (see Table 16 of the Baseline Risk Assessment report).

Each COC may affect more than one target organ, thus the sum of the hazard indices by target organ does not equal the total hazard index.

NA = Not applicable because this is not a primary target organ for any risk driver COCs on this table.

TABLE 10.8.CT

RISK ASSESSMENT SUMMARY (1)

CENTRAL TENDENCY

Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current/Future
Receptor Population: Other Recreational Person
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Surface Water	Kelley Brook and adjacent wetlands	Benzo(a)pyrene	1.E-08	---	7.E-06	7.E-06						
			Dibenz(ah)anthracene	2.E-09	---	3.E-06	3.E-06						
			Indeno(123-cd)pyrene	1.E-09	---	1.E-06	1.E-06						
			(Total)	2.E-07	---	1.E-05	1.E-05	(Total)		5.E-03	---	4.E-02	5.E-02
Sediment	Sediment	Kelley Brook and adjacent wetlands	Arsenic	2.E-06	---	6.E-06	8.E-06						
			(Total)	2.E-06	---	7.E-06	1.E-05	(Total)		4.E-02	---	5.E-01	5.E-01
						Total Risk Across Surface Water	1E-05					(3) Total Hazard Index Across All Media and All Exposure Routes	5.E-01
						Total Risk Across Sediment	1E-05						
						(2) Total Risk Across All Media and All Exposure Routes	2E-05						

(1) Sediment and surface water risk estimates apply only to the oil discharge area of Kelley Brook (sample locations OS-5 to OS-10).

(2) The "Total Risk Across All Media and All Exposure Routes" is the sum of the risk from surface water and sediment via ingestion and dermal contact.

(3) The "Total Hazard Index Across All Media and All Exposure Routes" is the HI for exposure to surface water and sediment via ingestion and dermal contact.

TABLE 10.9.RME
RISK ASSESSMENT SUMMARY
REASONABLE MAXIMUM EXPOSURE
Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current
Receptor Population: Trespasser
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation (1)	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation (1)	Dermal	Exposure Routes Total
Soil	Surface soil	0 to 1 foot soil	Benzo(a)pyrene	2.E-06	---	5.E-07	2.E-06	Polychlorinated Biphenyls	immune	1.E+01	---	4.E+00	2.E+01
			Polychlorinated Biphenyls	8.E-05	---	3.E-05	1.E-04	(Total)		1.E+01	---	5.E+00	2.E+01
			PCB-77	5.E-06	---	2.E-06	7.E-06						
			PCB-105	8.E-06	---	3.E-06	1.E-05						
			PCB-114	4.E-06	---	1.E-06	5.E-06						
			PCB-118	1.E-05	---	4.E-06	2.E-05						
			PCB-123	1.E-06	---	4.E-07	2.E-06						
			PCB-126	5.E-05	---	2.E-05	6.E-05						
			PCB-156	2.E-06	---	6.E-07	3.E-06						
			2,3,4,7,8-PeCDF	1.E-06	---	9.E-08	1.E-06						
			Arsenic	1.E-06	---	9.E-08	1.E-06						
			(Total)	2.E-04	---	6.E-05	2.E-04						

Total Risk Across Soil	2E-04
(2) Total Risk Across All Media and Direct Exposure Routes	2E-04
(3) Total Risk Across All Media and All Exposure Routes	2.E-04
(4) Total Hazard Index Across All Media and Direct Exposure Routes	2.E+01
(5) Total Hazard Index Across All Media and All Exposure Routes	2.E+01

(6) Total Hazard Index Divided by Target Organ

$HI_{hematologic}$	NA	HI_{immune}	2.E+01
$HI_{reproductive}$	NA	$HI_{gastrointestinal}$	NA
$HI_{central\ nervous}$	NA	HI_{skin}	NA
HI_{kidney}	NA	HI_{liver}	NA
$HI_{circulatory}$	NA		

(1) Risk from soil dust and vapor inhalation is based on modeled EPCs (see equations and text in section 3.3.6) and calculations of dose as shown in sections 3.4.6 and 3.4.7 of the Baseline Risk Assessment report.

(2) The "Total Risk Across All Media and Direct Exposure Routes" is the sum of the risk from the soil ingestion and soil dermal contact pathways.

(3) The "Total Risk Across All Media and All Exposure Routes" is the sum of the risk from the direct exposure pathways plus the soil dust and vapor inhalation pathways.

(4) The "Total Hazard Index Across All Media and Direct Exposure Routes" is the HI for exposure to soil via ingestion and dermal contact.

(5) The "Total Hazard Index Across All Media and All Exposure Routes" is the HI for the direct exposure pathways plus the soil dust and vapor inhalation pathways.

(6) The "Total Hazard Index Across All Media and Direct Exposure Routes" is divided based on the primary target organ for each COC (see Table 16 of the Baseline Risk Assessment report).

Each COC may affect more than one target organ, thus the sum of the hazard indices by target organ does not equal the total hazard index.

NA = Not applicable because this is not a primary target organ for any risk driver COCs on this table.

TABLE 10.9.CT

RISK ASSESSMENT SUMMARY

CENTRAL TENDENCY

Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Current
Receptor Population: Trespasser
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation (1)	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation (1)	Dermal	Exposure Routes Total
Soil	Surface soil	0 to 1 foot soil	Polychlorinated Biphenyls	8.E-06	---	8.E-07	9.E-06	Polychlorinated Biphenyls	immune system	3.E+00	---	2.E-01	3.E+00
			PCB-126	3.E-06	---	3.E-07	3.E-06	(Total)		3.E+00	---	3.E-01	3.E+00
			(Total)	1.E-05	---	1.E-06	1.E-05						

Total Risk Across Soil	1E-05
(2) Total Risk Across All Media and Direct Exposure Routes	1E-05
(3) Total Risk Across All Media and All Exposure Routes	1.E-05

(4) Total Hazard Index Across All Media and Direct Exposure Routes	3.E+00
(5) Total Hazard Index Across All Media and All Exposure Routes	3.E+00

(6) Total Hazard Index Divided by Target Organ

$HI_{hematologic}$	NA	HI_{immune}	3.E+00
$HI_{reproductive}$	NA	$HI_{gastrointestinal}$	NA
$HI_{central\ nervous}$	NA	HI_{skin}	NA
HI_{kidney}	NA	HI_{liver}	NA
$HI_{circulatory}$	NA		

(1) Risk from soil dust and vapor inhalation is based on modeled EPCs (see equations and text in section 3.3.6) and calculations of dose as shown in sections 3.4.6 and 3.4.7 of the Baseline Risk Assessment report.

(2) The "Total Risk Across All Media and Direct Exposure Routes" is the sum of the risk from the soil ingestion and soil dermal contact pathways.

(3) The "Total Risk Across All Media and All Exposure Routes" is the sum of the risk from the direct exposure pathways plus the soil dust and vapor inhalation pathways.

(4) The "Total Hazard Index Across All Media and Direct Exposure Routes" is the HI for exposure to soil via ingestion and dermal contact.

(5) The "Total Hazard Index Across All Media and All Exposure Routes" is the HI for the direct exposure pathways plus the soil dust and vapor inhalation pathways.

(6) The "Total Hazard Index Across All Media and Direct Exposure Routes" is divided based on the primary target organ for each COC (see Table 16 of the Baseline Risk Assessment report).

Each COC may affect more than one target organ, thus the sum of the hazard indices by target organ does not equal the total hazard index.

NA = Not applicable because this is not a primary target organ for any risk driver COCs on this table.

TABLE 10.10.RME

RISK ASSESSMENT SUMMARY

REASONABLE MAXIMUM EXPOSURE

Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation (1)	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation (1)	Dermal	Exposure Routes Total
Soil	Surface and subsurface soil	0 to 10 foot soil	Polychlorinated Biphenyls	6.E-06	---	1.E-06	8.E-06	Polychlorinated Biphenyls	immune	1.E+01	---	3.E+00	2.E+01
			PCB-77	2.E-06	---	4.E-07	2.E-06	(Total)		1.E+01	---	4.E+00	2.E+01
			PCB-105	1.E-06	---	3.E-07	2.E-06						
			PCB-118	2.E-06	---	4.E-07	2.E-06						
			PCB-126	5.E-06	---	1.E-06	6.E-06						
			(Total)	2.E-05	---	4.E-06	2.E-05						
Groundwater	Groundwater	Excavation Site	Benzene	3.E-08	---	8.E-06	8.E-06	Benzene	hematologic	7.E-02	---	2.E+01	2.E+01
			Tetrachloroethene	5.E-09	---	5.E-06	5.E-06	Ethylbenzene	liver, kidney	3.E-03	---	8.E+00	8.E+00
			Vinyl Chloride	8.E-06	---	1.E-04	1.E-04	Manganese	central nervous	5.E-02	---	3.E+00	3.E+00
			(Total)	8.E-06	---	2.E-04	2.E-04		(Total)	2.E-01	---	3.E+01	3.E+01

Total Risk Across Soil	2E-05
Total Risk Across Groundwater	2E-04
(2) Total Risk Across All Media and Direct Exposure Routes	2E-04
(3) Total Risk Across All Media and All Exposure Routes	2.E-04

(4) Total Hazard Index Across All Media and Direct Exposure Routes	5.E+01
(5) Total Hazard Index Across All Media and All Exposure Routes	5.E+01

(6) Total Hazard Index Divided by Target Organ

$HI_{hematologic}$	2.E+01	HI_{immune}	2.E+01
$HI_{reproductive}$	NA	$HI_{gastrointestinal}$	NA
$HI_{central\ nervous}$	3.E+00	HI_{skin}	NA
HI_{kidney}	8.E+00	HI_{liver}	8.E+00
$HI_{circulatory}$	NA		

(1) Risk from soil dust and vapor inhalation is based on modeled EPCs (see equations and text in section 3.3.6) and calculations of dose as shown in sections 3.4.6 and 3.4.7 of the Baseline Risk Assessment report.

(2) The "Total Risk Across All Media and Direct Exposure Routes" is the risk from the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.

(3) The "Total Risk Across All Media and All Exposure Routes" is the risk from the direct exposure pathways, plus the soil dust and vapor inhalation pathways.

(4) The "Total Hazard Index Across All Media and Direct Exposure Routes" is the HI for the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.

(5) The "Total Hazard Index Across All Media and All Exposure Routes" is the HI for the direct exposure pathways, plus the soil dust and vapor inhalation pathways.

(6) The "Total Hazard Index Across All Media and Direct Exposure Routes" is divided based on the primary target organ for each COC (see Table 16 of the Baseline Risk Assessment report).

Each COC may affect more than one target organ, thus the sum of the hazard indices by target organ does not equal the total hazard index.

NA = Not applicable because this is not a primary target organ for any risk driver COCs on this table.

TABLE 10.10.CT

RISK ASSESSMENT SUMMARY

CENTRAL TENDENCY

Beede Waste Oil/Cash Energy Site

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation (1)	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation (1)	Dermal	Exposure Routes Total
Soil	Surface and subsurface soil	0 to 10 foot soil	Polychlorinated Biphenyls	2.E-06	---	4.E-07	2.E-06	Polychlorinated Biphenyls	immune	8.E+00	---	2.E+00	1.E+01
			PCB-105	8.E-07	---	2.E-07	1.E-06	(Total)		8.E+00	---	2.E+00	1.E+01
			PCB-118	1.E-06	---	3.E-07	1.E-06						
			PCB-126	3.E-06	---	6.E-07	3.E-06						
			(Total)	8.E-06	---	2.E-06	9.E-06						
Groundwater	Groundwater	Excavation Site	Vinyl Chloride	5.E-07	---	6.E-06	6.E-06						
			(Total)	5.E-07	---	7.E-06	7.E-06	(Total)		4.E-02	---	2.E+00	2.E+00

Total Risk Across Soil	9E-06
Total Risk Across Groundwater	7E-06
(2) Total Risk Across All Media and Direct Exposure Routes	2E-05
(3) Total Risk Across All Media and All Exposure Routes	2.E-05

(4) Total Hazard Index Across All Media and Direct Exposure Routes	1.E+01
(5) Total Hazard Index Across All Media and All Exposure Routes	1.E+01

(6) Total Hazard Index Divided by Target Organ

$HI_{hematologic}$	NA	HI_{immune}	1.E+01
$HI_{reproductive}$	NA	$HI_{gastrointestinal}$	NA
$HI_{central\ nervous}$	NA	HI_{skin}	NA
HI_{kidney}	NA	HI_{liver}	NA
$HI_{circulatory}$	NA		

(1) Risk from soil dust and vapor inhalation is based on modeled EPCs (see equations and text in section 3.3.6) and calculations of dose as shown in sections 3.4.6 and 3.4.7 of the Baseline Risk Assessment report.

(2) The "Total Risk Across All Media and Direct Exposure Routes" is the risk from the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.

(3) The "Total Risk Across All Media and All Exposure Routes" is the risk from the direct exposure pathways, plus the soil dust and vapor inhalation pathways.

(4) The "Total Hazard Index Across All Media and Direct Exposure Routes" is the HI for the soil ingestion, soil dermal contact, groundwater ingestion, and groundwater dermal contact exposure pathways.

(5) The "Total Hazard Index Across All Media and All Exposure Routes" is the HI for the direct exposure pathways, plus the soil dust and vapor inhalation pathways.

(6) The "Total Hazard Index Across All Media and Direct Exposure Routes" is divided based on the primary target organ for each COC (see Table 16 of the Baseline Risk Assessment report).

Each COC may affect more than one target organ, thus the sum of the hazard indices by target organ does not equal the total hazard index.

NA = Not applicable because this is not a primary target organ for any risk driver COCs on this table.